

**AN EXPLORATORY STUDY OF
MULTIPLE STAKEHOLDER VIEWS ON
HIGHER EDUCATION ENTREPRENEURIAL ECOSYSTEMS
IN A RESOURCE-CONSTRAINED ENVIRONMENT**

Submitted in fulfilment of the requirements for degree of
Doctor of Philosophy

Nilusha Gallage (102364009)

**School of Business, Law and Entrepreneurship
Swinburne University of Technology**

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ABSTRACT

Similar to businesses around the world, higher education institutions are giving importance to their entrepreneurial ecosystems focusing on knowledge commercialisation and student start-ups. At the same time, there is limited scholarly literature available on higher education entrepreneurial ecosystems developing students for entrepreneurship within more resource-constrained environments. This is problematic as a lack of entrepreneurial education and support for entrepreneurs reduce the possibilities of start-up success. Given the importance of ecosystems in the higher education context (HEEE), the purpose of this study is to investigate how higher education entrepreneurial ecosystems can influence students' entrepreneurial development in resource-constrained environments.

This study addresses three key topics: how do diverse stakeholders anticipate the continued development of HEEEs in a resource-constrained environment?; what do diverse stakeholders perceive as the contextual factors of HEEEs that could influence students' E&I capabilities in a resource-constrained environment?; and how can diverse stakeholders engage in the factors of HEEEs that could influence students' E&I capabilities in a resource-constrained environment. Using exploratory qualitative research, four questions related to continued development, composition and social capital are investigated. An interpretative perspective of diverse views was drawn from 40 interviews held at 2 points in time with 6 stakeholder categories of the entrepreneurial ecosystem representing multi-levels in a resource-constrained environment. Content analysis using NVivo includes qualitative themes and pattern quantification presented in the form of a re-ordered matrix and spectrum diagram.

The interviews indicate that higher education entrepreneurship ecosystems in Sri Lanka are still in the initial phase of co-creation. It is evident that these ecosystems in Sri Lanka have not kept up with pace as they are not actively supporting entrepreneurship, unlike literature well documented in developed countries. In Sri Lanka, higher education entrepreneurship ecosystems suffer from a lack of internal drive from the top management of institutions and external support from the entrepreneurial ecosystem. Findings contribute to literature by extending four academic discussions: (1) HEEEs beyond start-ups to E&I capabilities of students; (2) Beyond the common HEEE factors to contextual factors; (3) Beyond the HEEE factors to actors; and (4) Beyond the composition of HEEEs to social capital and connections. This study brings entrepreneurship and innovation capabilities to HEEE literature advocating for human capital development of entrepreneurs in resource-constrained environments.

The emerging role of higher education entrepreneurial ecosystems is dichotomous, focusing on both entrepreneurship and innovation. Implications and recommendations are formulated, leading in particular to developing entrepreneurship and innovation capabilities of students within higher education entrepreneurship ecosystems in resource-constrained environments. This study contributes empirical findings with a deeper understanding on the concept HEEE that currently lacks theoretical clarification and empirical research in resource-constrained environments. The contribution of this study recognizes a set of interrelated factors and actors of a higher education entrepreneurship ecosystem that can operationally address the challenges in a more resourced constrained environment and how it might bring a focus on developing students' entrepreneurship and innovation capabilities. The findings also open new avenues intersecting with various disciplines including strategic management and design for entrepreneurship researchers in the higher education context.

Keywords – Higher education entrepreneurial ecosystems; student entrepreneurial development; entrepreneurship and innovation capability; stakeholders; resource-constrained environment; Sri Lanka.

DECLARATION

This thesis:

- contains no material that has been accepted for the award to the candidate of any other degree or diploma, with due reference made about this in the text of the examinable outcome;
- to the best of the candidate's knowledge contains no material previously published or written by another person except where due reference is made in the text of the examinable outcome;
- contains less than 100,000 words in length exclusive of bibliography and appendices;
- was professionally edited by Adam Finlay, an IPEd accredited editor, in terms of Standards D and E covered in the Australian Standards for Editing Practice including style of presentation and grammar, with no change to substantive content of the examinable outcome; and
- has met all the requirements of the ethical approval from the Swinburne University of Technology Human Research Ethics Committee under the project 202915-5183.

Nilusha Gallage

5 October 2022

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“What’s more important, the journey or the destination?

Neither. It is the people you travel with.”

This was an intriguing quote shared by Professor David Audretsch during my doctoral journey. Travelling with you all makes the destination worthy of the journey and I am grateful to all the people who contributed towards the accomplishment of this PhD thesis.

Submitting this thesis is a significant moment in my life as an academic and in a way, I consider it as my own ‘start-up’. To express the meaning of this piece of work to me, I would like to relate to a statement by Kuratko (2005, p. 592) that “entrepreneurial history will judge you, and as the years pass, you will judge yourself, on the extent to which you have used your abilities to pioneer and lead our universities into a new horizon. In your hands is the future of your entrepreneurial world and the fulfillment of the best qualities of your own spirit.” To the best of my ability, this is my initiative to move higher education institutions in resource-constrained environments forward. This research on the nexus of higher education entrepreneurial ecosystems and student entrepreneurial development is integrative to my academic career and higher education. I dedicate my career to discovering knowledge and developing students, specifically for entrepreneurship and innovation.

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ABBREVIATIONS

E&I	entrepreneurship and innovation
GDP	gross domestic product
HEEE	higher education entrepreneurial ecosystem
SDG	Sustainable Development Goal
SME	small-to-medium enterprise
UK	United Kingdom
US	United States of America

CANDIDATURE JOURNEY (MAY 2019 – OCTOBER 2022)

Graduate certificate

Completion of GC-RESIM with High Distinction (Project Management 90%; Innovation and Impact 84%; Qualitative Methods 80% and Quantitative Methods 78%)

Book chapter

Gallage, N., Selvarajah, C., & Laferriere, R. (2022). Ecosystem engagement in entrepreneurship education. In Larios-Hernandez, G., Walmsley, A., & Lopez-Catsro, I. (Eds.), *Theorising Undergraduate Entrepreneurship Education: Pedagogy, Digital Teaching, and Scope*. Palgrave Macmillan.

Conference paper presentation

Gallage, N., Le, V., & Laferriere, R. (2022, February). Higher education entrepreneurial ecosystem for students' entrepreneurial development. [Paper presentation]. Australian Centre for Entrepreneurship Research Exchange (ACERE) Conference, Melbourne, Australia.

Conference participation

2021 – Babson College Entrepreneurship Research Exchange Conference (BCERC)

2021 – Australian Centre for Entrepreneurship Research Exchange (ACERE) Conference

2022 – Australian Centre for Entrepreneurship Research Exchange (ACERE) Conference

Research competition

2021 - Finalist from School of Business, Law and Entrepreneurship at the 'Visualise Your Thesis' competition (university level)

Skill development

4-day short course on writing a qualitative PhD facilitated by Australian Consortium for Social and Political Research Inc (ACSPRI), Australia

5-day short course on qualitative data analysis using NVivo facilitated by Australian Consortium for Social and Political Research Inc (ACSPRI), Australia

Research assistant

Assistant to a senior lecturer on multiple research projects from RMIT University

Assistant to a senior lecturer on a research project from Deakin University

Teaching

Sessional tutor at Swinburne University

Sessional lecturer, course coordinator, head tutor and tutor at RMIT University

Head facilitator and course facilitator at RMIT Online

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CHAPTER 1: INTRODUCTION

1.1 Chapter overview

This PhD study explores the concept of ‘higher education entrepreneurial ecosystems’ (HEEEs, also known as university-based entrepreneurship ecosystems). The research context is on a South Asian country (i.e. Sri Lanka) given the increasing importance of HEEEs in developing countries with resource-constrained environments. This chapter introduces HEEEs to establish the significance of the topic for the world and research area. The following details the research background complemented by the practical background, identifies the research gaps in the form of knowledge needs, establishes the research objectives, describes the research design followed by the scope and limitations, and outlines the dissertation.

This introduction chapter is organised according to ‘Creating A Research Space’ (CARS) model by Swales and Najjar (1987), as presented below in Figure 1.1. This structure of the introductory chapter provides a clear pattern, including the situation, the problem and the solution.

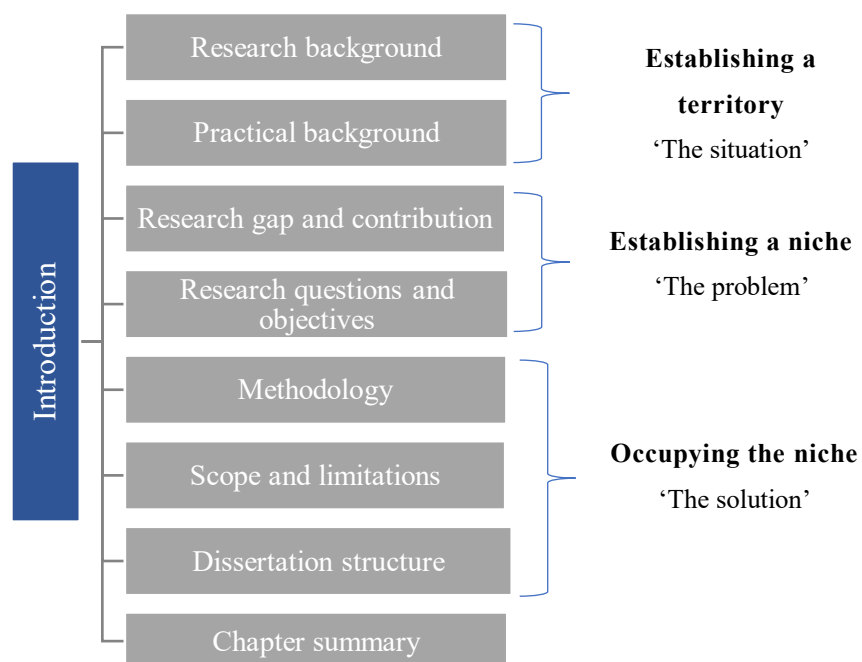


Figure 1.1 – Chapter 1 outline

1.2 Research background

The conjunction of entrepreneurship and economic development emphasises the third mission, of teaching, research and entrepreneurship, among higher education institutions (Etzkowitz & Leydesdorff 2020). Higher education institutions have entered a state of transformation due to the increasing expectations of contributions towards entrepreneurship and innovation leading to economic development (Guerrero et al. 2016). More recently, higher education institutions have faced increasing demands for preparing students for future work, particularly following the current COVID-19 pandemic (Bock et al. 2020; Liguori & Winkler 2020; Maritz et al. 2020; Ratten & Jones 2020). Educating the next generation is acknowledged as a natural role of higher education institutions, and skilled graduates are critical outcomes (Wennberg, Wiklund & Wright 2011).

Etzkowitz (1983) defined entrepreneurial universities as higher education institutions considering the possibilities of entrepreneurship and innovation. The emergence of higher education institutions assuming their third mission duties was prevalent in the United States (US), with Massachusetts Institute of Technology, Stanford University and Babson College. This trend spread beyond the US and Europe to other developed and developing countries, including the United Kingdom (UK), Canada (Bramwell & Wolfe 2008), Australia, China (Zhou & Peng 2008), Singapore (Wong, Ho & Singh 2007), Malaysia (Ahmad et al. 2018), Chile (Bernasconi 2005) and Brazil (Amaral, Ferreira & Teodoro 2011). Many countries have now reformed their higher education systems to become catalysts for economic and social development (Gibb & Hannon 2006). Knowledge societies demand the production of human capital to pursue entrepreneurship, drive innovation, increase competitiveness and influence sustainable development (Guerrero, Cummingham & Urbano 2015). Ultimately, in the context of entrepreneurship, higher education institutions hold the purpose of ensuring their students thrive in their endeavours (Audretsch 2014). Governments and scholars argue that higher education institutions must become entrepreneurial for this responsibility and more institutions have embarked on this transformational journey (Clark 2004; Guerrero & Urbano 2014).

In becoming entrepreneurial, higher education institutions are undertaking diverse entrepreneurial pathways, with strategic choices to demonstrate their commitment and involvement in entrepreneurship initiatives within the institution (Klofsten et al. 2019). One of the core entrepreneurial pathways is higher education entrepreneurial ecosystems (HEEEs, also known as university-based entrepreneurship ecosystems). Building on the ecosystem perspective, HEEEs have gained prominence since the early 2000s (Fetters, Greene & Rice

2010). As a contemporary concept, the theoretical development of HEEEs is in the early stages, and the concept of an HEEE is novel and emerging (Hsieh & Kelley 2020; Longva 2021). One of the earliest references to HEEEs is found in the scholarly work by Fetters, Greene and Rice (2010) that discusses pathways to developing HEEEs with wide-ranging missions and resources in different contexts. The same notable research included a series of case studies of six higher education institutions, leading to seven key success factors that support entrepreneurship through entrepreneurship education and entrepreneurial support (Rice, Fetters & Greene 2014). Since then, an increasing number of studies have examined the composition of HEEEs, categorising the factors that form a comprehensive and highly evolved HEEE with contextual relevance (Stam & Spigel 2016). In regard to HEEE literature, there is an increasing critique that studies are producing lists of ‘what’ an HEEE is rather than explanations of ‘how’ such HEEEs work and this view can be improved (Longva 2021).

The economist Joseph Schumpeter advocated creative destruction associated with new outcomes and new ways of doing things (Schumpeter 1934). One of the observed limitations of the extant literature is that HEEEs have been largely examined from a static perspective. HEEEs are generally known for generating student start-ups, following the trend in entrepreneurial ecosystems. In 2020, the global start-up economy generated USD3 trillion in value (Startup Genome 2021). While many factors have been garnered about the composition of HEEEs, little is known about the future – the continued development. Scholarly work on HEEEs position them as self-standing ecosystems of a respective higher education institution (Lahikainen et al. 2019). However, higher education institutions are identified as a domain of the entrepreneurial ecosystem (Isenberg 2010) and HEEEs should be considered a sub-ecosystem of the wider entrepreneurial ecosystem, engaging with various stakeholders (Wurth, Stam & Spigel 2021). In this study, a key focus is to explore how HEEEs can develop and evolve considering a broader perspective from diverse stakeholders.

Unlike an ecological system that organically develops, HEEEs are co-created and managed by higher education institutions. Higher education institutions are understood to fulfill their core teaching and research activities while providing a conducive environment for students to explore and exploit ideas for the economic and social development of cities, regions or countries (Klofsten et al. 2019). A potential student entrepreneur requires education and support that develops and reinforces their entrepreneurial capabilities (Rodríguez-López & Souto 2020). The concept of capabilities represents skills, expertise, acumen and knowledge, terms interchangeably used in entrepreneurship literature (Liu, Kulturel-Konak & Konak

2021). Entrepreneurial capabilities involve the ability of an entrepreneur to start and grow a new venture using a combination of resources (Gumsay & Bohne 2018). These entrepreneurial capabilities include the ‘know-what’ (declarative) and ‘know-how’ (procedural) along with an understanding of ‘why’ for each potential entrepreneur (Hagg 2017; Willians-Middleton & Donnellon 2014). However, the development of entrepreneurial capabilities is rarely discussed in the HEEE literature and emerges from this study. Extant studies have examined HEEEs primarily for student start-ups (Allahar & Sookram 2019; Meyer et al. 2020; Miller & Acs 2017; Shil et al. 2020; Wright, Siegel & Mustar 2017) and more recently in preparing students for entrepreneurship through entrepreneurial mindset and intention (Guerrero, Urbano & Gajón 2020; Secundo et al. 2020; Webber, Kitagawa & Plumridge 2020). While it is evident that students are central to HEEEs (Miller & Acs 2017), it is unclear how HEEEs stimulate students’ entrepreneurial development.

Unlike in developed countries, co-creating HEEEs in a resource-constrained environment is inherently challenging (Bedó, Erdős & Pittaway 2020). Extending the context to Sri Lanka, it has been shown that, within South Asia, Sri Lanka has one of the highest youth unemployment rates, and its educated youth are disengaged from employment (International Labour Organisation 2020). According to the World Bank (2020) Sri Lanka is a lower-middle income country with a GDP per capita of USD3,852 in 2019, which is similar to other developing countries in South Asia, including India, Pakistan, Bangladesh and Bhutan. Within Asia, Sri Lanka is an emerging economy like Cambodia, Indonesia, Myanmar, the Philippines and Vietnam. Previous studies, such as Kodithuwakku and Rosa (2002), Lin et al. (2013) and de Silva, Uyarra and Oakey (2012), have explored entrepreneurship while characterising Sri Lanka as a resource-constrained environment. This study focuses on exploring the development of HEEEs within a resource-constrained environment.

When designing a research study on HEEEs, the perceptions and experiences of social actors within and related to them are paramount to understanding the concept. Higher education institutions are not just responsible for their missions, but also to engage with stakeholders outside the institution promoting commercial and non-commercial knowledge (Huang-Saad, Duval-Couetil & Park 2018). All stakeholders should be involved in HEEEs (Rice, Fetters & Greene 2014). However, in HEEE literature, the stakeholders who shape and operationalise the environment are rarely heard from as a whole. Most studies have investigated HEEEs among either internal or external stakeholders (Longva 2021; Webber, Kitagawa & Plumridge 2020), with a few early exceptions investigating HEEEs covering both internal and external

stakeholders (Rice, Fetters & Greene 2014; Wright, Siegel & Mustar 2017). In instances when both stakeholder categories were investigated, such studies were based in developed countries, including the US. While diverse stakeholder perspectives are limited in HEEE literature, this research garners broader perspectives, drawing on participation from stakeholders representing the HEEE and the wider entrepreneurial ecosystem. This research explores and interprets multiple views from internal and external stakeholders, including internally, deans/heads of schools, academics/educators, and externally, alumni entrepreneurs, established entrepreneurs, angel investors and support professionals in Sri Lanka. More details on methodology are detailed in Section 1.6.

Understanding the development of HEEEs can improve by researching it as a sub-ecosystem of the wider entrepreneurial ecosystem in a resource-constrained environment, considering broad perspectives from diverse stakeholders. This study intends to add to the current understanding and knowledge of HEEEs by investigating (1) at a systems level to explore their continued development; (2) at an institutional level to determine the contextual factors and mechanisms relevant for developing students in a resource-constrained environment; and (3) at an individual level to discover stakeholder engagement influences on students' entrepreneurial development.

1.3 Practical background

“While having the largest youth labour force in the world, more than half of South Asian youth are not on track to have the education and skills necessary for employment in 2030.”

Justin Van Fleet, Executive Director of the Global Business Coalition for Education, shared at the Global Business Coalition for Education forum in 2020 (UNICEF 2020).

The above quote exemplifies the challenge that the education sectors of South Asian countries are currently facing. Justin Van Fleet, Executive Director of the Global Business Coalition for Education, supports the view that the next generation of youth lack self-employment and entrepreneurship-related skills among the skills needed for 21st-century work (UNICEF 2020). Industry research conducted by McKinsey & Company (2020) found that entrepreneurship is a future work skill in the changing world by surveying 18,000 individuals in 15 countries. Under the broad category of leadership, entrepreneurship was an essential skill required by individuals, influencing their career, income and satisfaction. Thus, McKinsey & Company

(2020) suggest that higher education institutions should reform their education systems to focus more strongly on relevant skills including entrepreneurship and ensure lifelong education.

1.3.1 Sustainable Development Goals

In recent years under the United Nations Sustainable Development Goals (SDGs) commitment, 189 countries have strived to achieve 17 goals for sustainable development (United Nations 2020). The 2030 Agenda for Sustainable Development encourages member states to meet these goals, including SDG8 to improve economic growth through youth, job creation, employment, entrepreneurship, and small-to-medium enterprises (SMEs) (United Nations 2020). Therefore, there is considerable enthusiasm for entrepreneurship which is embedded within the national agenda of many countries as a policy and strategy to overcome economic challenges and achieve growth (Cander et al. 2020).

South Asia falls behind other regions, with over 50% of South Asian youth not receiving the education and skills necessary for employment in 2030, meaning these countries are not developing the next generation of youth with the skills essential for the 21st century (UNICEF 2020). This dilemma brings attention to SDG4 aimed at quality education and SDG8 directed at decent work and economic growth. Focusing on quality education, Target 4.4 intends “to substantially increase the number of youth and adults who have the relevant skills for employment, decent jobs and entrepreneurship” (United Nations 2020). At the same time, Target 8.3 promotes “development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation” and Target 8.6 strives to “substantially reduce the proportion of youth not in employment, education or training” (United Nations 2020). With less than a decade to achieve these goals and targets by 2030, there is a strong imperative for countries to reap benefits from their youth by investing in the development of their skills, talent and capabilities (UNICEF 2020). This urgency shows that enabling youth, specifically students with relevant capabilities, to pursue entrepreneurial career paths is contemporary, and countries can benefit from research on developing their youth. To a large extent, entrepreneurial capabilities are applied across multiple job roles including self-employment, hybrid entrepreneurship and intrapreneurship (Alsos et al. 2022). While SDG4 and SDG8 have a reciprocal impact, this research pays attention to quality education.

1.3.2 National prosperity

Countries do not inherit national prosperity: it is created (Acs et al. 2016). In the rush to promote decent work, economic growth and innovation development, scholars and

governments have embraced entrepreneurship (Audretsch et al. 2021) and there is an increasing interest in entrepreneurship by governments at all levels worldwide (Minniti & Lévesque 2008). However, most seminal work on entrepreneurship has been largely associated with developed countries, and the returns of entrepreneurship in developing countries are yet to draw attention (Sautet 2013).

Globally, entrepreneurship is perceived as an engine of economic growth and societal development (Alvarez et al. 2014). At its core, entrepreneurship is recognised as valuable for sustainable development with the opportunity for a country's economic growth and social development leading to national prosperity (Hall et al. 2010). Notable researchers have argued a range of economic and social benefits generated from entrepreneurship, ranging from economic development (Carlsson 2013; Acs et al. 2008; Wennekers & Thurik 1999; Schumpeter 1934); innovation (Wong et al. 2005; Acs & Audretsch 1988; Schumpeter 1934); job creation (NBIA 2014; Parker 2009; Gibb 1996); productivity (van Praag & Versloot 2007); technology transfer and knowledge spillovers (Terjesen & Wang 2013; Acs et al. 2012; Grimaldi et al. 2011); venture creation (Ronstadt 1985); sustainable development (Hall et al. 2010; Brugmann & Prahalad 2007) and community development (Espinoza et al. 2019). Although some studies have confirmed the impact of entrepreneurship on economic performance to be strong and positive (Zoltan et al. 2008; van Praag & Versloot 2007; Wong et al. 2005; Wennekers & Thurik 1999), this correlation continues to be under investigation for further insights (Urbano et al. 2019; Du & O'Connor 2018).

1.3.3 Global start-up economy and ecosystem

In 2020, the global start-up economy was valued nearly at USD3 trillion (Startup Genome 2021). This global start-up economy is not limited to the developed world and in fact is expanding in developing countries, including Sri Lanka (Startup Genome 2021). Despite the challenges faced by the COVID-19 pandemic, the global start-up economy remains large. According to the Global Entrepreneurship Monitor (2021) two shockwaves caused by the pandemic are impacting start-up ecosystems globally: (1) a capital crunch for funding start-ups across the world; and (2) a demand drop in revenue like most operating companies. While the effect of these shockwaves is severe, Startup Genome (2021) claims that post crisis, top start-up ecosystems will continue to perform well and emerging ecosystems need to invest now to arrive at that progress. Post COVID-19 recovery is expected to result in new ecosystems rising. According to the policy advisory of Startup Genome (2021), governments need to take the lead and support start-ups similar to traditional sectors and small businesses. As the start-up

ecosystem grows, the entrepreneurial ecosystem including higher education needs to further develop producing more value (Startup Genome 2021).

Since 2017, Silicon Valley has held the number one position for global start-up ecosystems among 30 ecosystems around the world (Startup Genome 2021). In 2020, Silicon Valley was followed by New York and London in a tied second position. These start-up ecosystems have depth of talent, experience and capital, creating a conducive environment for start-ups. In terms of continent representation within the top global ecosystems, North America is leading followed by Europe and then Asia-Pacific. There is a rise of ecosystems in the Asia-Pacific region, from 20% in 2012 to 30% in 2020 of top ecosystems on the global stand (Startup Genome 2021). The Global Entrepreneurship Monitor (2018) found that among nine conditions that influence entrepreneurs and their businesses in the ecosystem, Asia-Pacific held the highest place in physical infrastructure and lowest in entrepreneurship education. Sri Lanka is recognised among the top 20 global ecosystems for 'bang for buck' and having great potential for its talent (Startup Genome 2021). Among Asia-Pacific countries, Sri Lanka has not yet made it in the top 30 global ecosystems or challenger ecosystems ranked by Startup Genome (2021). However, Sri Lanka ranks second place for its affordable talent while the top three global ecosystems, Silicon Valley, New York and London, ranked 10th position for their talent.

1.3.4 COVID-19 pandemic and entrepreneurship

The COVID-19 pandemic that struck in early 2020 had a catastrophic impact on global societies, businesses and economies. Unprecedented interruptions were caused to people, resources and capital, disrupting the higher education landscape (Liguori & Winkler 2020). Since the pandemic, higher education institutions have faced severe challenges, having lost billions in revenue, and need to re-think their teaching, research and entrepreneurship for sustainable development (Maritz et al. 2020). Emerging scholarly work advocates the value of entrepreneurship and entrepreneurship education as countries strive towards economic recovery (Giones et al. 2020; Liguori & Winkler 2020; Ratten & Jones 2020). Developing entrepreneurial youth is, thus, timely and relevant when global forums are advocating the benefits of entrepreneurship, and governments are implementing policies that support economic and societal development (Álvarez et al. 2014; Minniti & Lévesque 2008). It is ever more important now given the economic recovery after the COVID-19 crisis through entrepreneurship (Ratten 2020; Espinoza et al. 2019). When the pandemic struck, there was a tendency for necessity entrepreneurship and starting a business was identified as the best alternative when jobs are scarce (Global Entrepreneurship Monitor 2021).

1.4 Research gap and contribution

This study belongs to the domain of HEEEs in the field of entrepreneurship. Scholarly work on HEEEs has a close relationship with research on entrepreneurial universities and entrepreneurial ecosystems. There are instances where these domains overlap within the HEEE literature. Research gaps are identified and presented as system-level knowledge needs, institutional-level knowledge needs and individual-level knowledge needs. The expected contribution illustrates the relationship between HEEEs and capability development that should enhance the current discussions in this research field, which might inform higher education institutions on developing their HEEEs and enlighten entrepreneurship scholars on the state of HEEEs in a resource-constrained environment. This study builds on a deep tradition in social science by exploring a link between HEEEs and capability development that remains relatively underrepresented in the area of research.

1.4.1 System-level knowledge needs

Current literature positions HEEEs as a standalone ecosystem (Lahikainen et al. 2019) and is conceived as independent (Autio et al 2014). This ignores the system-ness of HEEEs and disregards one of their main characteristics as an ecosystem. A recent literature review on entrepreneurial ecosystems suggested that future research should explore the complex system of the nature of ecosystems (Wurth, Stam & Spigel 2021). The way forward must not be based on the consideration that HEEEs are self-sufficient ecosystems limited to their institutional environment and isolated from their broader environment. Moreover, Webber, Kitagawa and Plumridge (2020) call for future research to propose a conceptual framework that embeds HEEEs into the wider entrepreneurial ecosystem. HEEEs are emerging to be closely connected and spreading rapidly (Feldman, Siegel and Wright 2019). While respecting the extant literature, this study intends to explore HEEEs with a holistic view.

HEEEs still lack a consistent theoretical foundation and empirical base (Hsieh & Kelley 2020; Longva 2021). The current literature is a collection of studies mostly focused on the composition of HEEEs, specifically the factors that influence student start-ups, entrepreneurial intentions and entrepreneurial mindsets. Emerging research suggests that nested sub-ecosystems link to outputs and outcomes of the entrepreneurial ecosystem (Wurth, Stam & Spigel 2021). In this sense, there is not enough understanding of how HEEEs relate to their wider entrepreneurial ecosystems and whether their outcomes such as student start-ups, entrepreneurial intentions and entrepreneurial mindsets align with the entrepreneurial

ecosystem. A more nuanced understanding of the evolution of HEEEs is needed, taking into consideration that higher education institutions are responsible for a third mission.

The emergence of HEEEs seems to be triggered by the specific outcome of student start-ups (Johnson, Bock & George 2019). In contrast, today's higher education institutions should produce entrepreneurial capital and be catalysts for regional economic and societal development (Audretsch 2014; Guerrero, Cunningham & Urbano 2015). Entrepreneurs and their capabilities are essential to the success of start-ups (Kyndt & Baert 2015). An emerging entrepreneur, such as a student, requires education and support that complements and reinforces their entrepreneurial capabilities by combining different essential ingredients for entrepreneurship (Rodríguez-López & Souto 2020).

With less than 10 years to achieve the SDGs, higher education institutions are striving towards sustainable development. Students represent a proportion of the skilled human capital, and the target is to increase the number of youth with entrepreneurship skills (United Nations 2020). Higher education institutions hold responsibility to critically review their strategies and initiatives within the context of broader stakeholders (Huang-Saad et al. 2018), and since the COVID-19 pandemic, this has become a greater responsibility for higher education institutions, to develop their students for future work (Ratten & Usmanij 2020). In this case, should HEEEs contribute to entrepreneurship beyond students' start-ups, entrepreneurial intentions and mindset? Scholars suggest future research to pay attention to pre-venture capability development to understand the range of capabilities that one should be equipped with to pursue an entrepreneurial career (Gümüşay & Bohné 2018; Rasmussen et al. 2011). In response, more research is needed to investigate how diverse stakeholders anticipate the continued development of HEEEs.

1.4.2 Institutional-level knowledge needs

Within HEEE scholarly work, studies have been largely confined to exploring HEEEs leading to student start-ups, student entrepreneurial intentions and mindset. In this vein, previous studies have explored why some higher education institutions generate more start-ups than others located in developed countries (Di Gregorio & Shane 2003; O'Shea et al. 2008; Shane 2004; Wright et al. 2004; Guerrero et al. 2014; Guerrero & Urbano 2017; Guerrero et al. 2017; Guerrero et al. 2018). Many higher education institutions still focus on delivering entrepreneurship education instead of exercising their wider efforts to focus on student development (Martiz et al. 2020; Birch et al. 2017). A core value proposition for any higher

education institution is to provide quality higher education for their students and university-based initiatives likely to have long-term sustainability and impact (O'Brien, Cooney & Blenker 2019).

HEEEs are initiatives of higher education institutions in becoming entrepreneurial. According to early literature, higher education institutions have alternative pathways to develop a comprehensive and highly evolved HEEE, as its contextual factors may vary according to its geographic context and institutional characteristics (Rice, Fetters & Greene 2014). Such contextual factors refer to environment-specific factors noted as significant in shaping entrepreneurial activities of HEEEs by Webber, Kitagawa and Plumridge (2020), in contrast to studies focusing on individual and institutional factors. The same study ascertained the importance of contextual factors of higher education institutions shaping students within an HEEE. The challenge is how higher education institutions recognise the suitable factors within their institutional architecture to drive entrepreneurship (Cunningham, Lehmann & Menter 2021). There is a lack of theoretical understanding of HEEE factors, and research has yet to clarify or define these factors (Hsieh & Kelly 2020). In addition to composition, there is little known about how to configure an HEEE to serve its functions (Delanoë-Gueguen & Theodoraki 2021). This calls for research to explore the composition and configuration of HEEEs at an institutional level.

Governments around the world benchmark and attempt to replicate entrepreneurial ecosystems, proven to be successful in other countries, into their development plans and policies (Hruskova & Mason 2020). Such successful environments are impossible to re-create in the context of entrepreneurial ecosystems as successful ecosystems are context-dependent, embracing local conditions and characteristics (Spigel 2016). Therefore, it is understood that entrepreneurship is a social practice, and context is of the essence (Longva 2021; Welter 2011). Context is important for understanding how, why and when entrepreneurship happens as the contextual characteristics and conditions influence entrepreneurs and the way they start and run a new venture (Welter & Smallbone 2011; Welter 2011). Challenges and opportunities vary drastically in different parts of the world, making it impossible to benchmark ecosystems (Volkman et al. 2021). Differences across the world reflect a more heterogeneous student community, which may have varied and complex needs, requiring a tailored ecosystem (O'Brien, Cooney & Blenker 2019). Further, a 'one-size-fits-all' approach that considers higher education institutions as homogeneous is unrealistic, which means there is no

benchmark solution (Degl'Innocenti et al. 2019; Benneworth et al. 2016; Ertuna & Gurel 2011).

HEEEs began in the US and are commonly investigated in developed countries and high-income economies (Kirby 2004). Unlike in developed countries such as the US, UK and Australia, co-creating HEEEs in a resource-constrained environment where factors of a successful HEEE might have gaps is a critical challenge (Bedó, Erdős & Pittaway 2020). For instance, successful HEEE factors of higher education institutions located in Silicon Valley are less favourable for HEEEs in developing countries suffering from lack of resources. Benchmarking HEEE factors found in successful HEEEs of such countries is likely to raise contradictions in resource-scarce environments. As an initial step, Bedó, Erdős and Pittaway (2020) suggested a conceptual framework of an HEEE in a resource-constrained environment. Given the lack of empirical evidence of co-creating HEEEs in a resource-constrained environment, it is important to gain a deeper understanding of their composition and configuration with resource constraints and, in particular, how the contextual factors of HEEEs drive entrepreneurship in such an environment. Taking a context perspective in entrepreneurship research (Audretsch & Belitski 2016), more research is called for to investigate what diverse stakeholders perceive as the contextual factors of HEEEs that could influence students' capability development in a resource-constrained environment.

Although there is emerging literature that contributes to the composition of HEEEs, there is not much research beyond the list of factors such as explanations of 'how' such HEEEs work (Longva 2021). The usefulness of the HEEE depends on an advanced understanding of 'what' the contextual factors are combined with 'how' these factors can be operationalised and 'why' such mechanisms are relevant for a resource-constrained environment. Without such knowledge, higher education institutions are mostly left with HEEE models based in developed countries that cannot be considered to their context due to resource constraints. While an HEEE as a concept itself lacks conceptual clarity (Hsieh & Kelley 2020), more work is required that focuses on the contextual factors, their mechanisms and rationale. In this case, how and why specific contextual factors of HEEEs could influence students' E&I capabilities in a resource-constrained environment. Initially, the focus was on students' entrepreneurial development before E&I capabilities emerged from the first research question.

1.4.3 Individual-level knowledge needs

Although HEEEs, like entrepreneurial ecosystems, include a combination of factors and actors, a majority of the emphasis is on the factors of HEEEs. Ecosystems are a common platform for organisations to create and capture value by interacting with other stakeholders through inclusiveness (Nylund et al. 2021). Despite higher education institutions striving towards contributing to sustainable development for the greater community, the role of stakeholders is understudied (Clauss et al. 2018). A recent study found that a sustainable ecosystem requires important involvement from internal stakeholders in creating collaborative connections (Delanoë-Gueguen & Theodoraki 2020). Future directions call for research to use theories related to stakeholders in HEEE studies influencing students (Guerrero, Urbano & Gajón 2020). Higher education institutions have a responsibility to critically review their HEEE and its strategy within a context of many stakeholders (Huang-Saad, Duval-Couetil & Park 2018).

Higher education institutions and their HEEEs need to consider the wider and different stakeholders involved in being part of the entrepreneurial ecosystem (Ratten & Usmanij 2020). Scholars such as Bischoff (2021) found that stakeholder support and collaboration are crucial for successfully developing entrepreneurial ecosystems. Although higher education institutions creating shared value with various stakeholders have been investigated in different settings, little is known about how stakeholders can support higher education institutions (Cunningham, Lehmann & Menter 2021; Karwowska 2019). Emerging research has found that active participation of stakeholders in entrepreneurship programs is paramount, and ensuring its sustainability and creating a network of stakeholders is fundamental to ensuring student interactions (Galvão et al. 2020). Exploring stakeholders and their engagement could be helpful to understand more than who is or can be included and their relationships within an HEEE (Tejero, Pau & Leon 2019). Sri Lanka does not have adequate institutional frameworks and supportive mechanisms to promote such interactions beyond the institutions (de Silva, Uyarra & Oakey 2012). Future research calls for more investigation to explore how stakeholders can engage in evolving HEEEs as higher education institutions need to work together with other stakeholders (Ratten & Jones 2020; Theodoraki, Messeghem & Rice 2018). In response, this study aims to address the lack of understanding and knowledge about stakeholder engagement in HEEEs.

HEEEs, being relatively nascent and evolving, are understudied, so there is a need for more profound insights into co-creating stronger HEEEs to support students keen to become entrepreneurs (Longva 2021). Different stakeholders of various ecosystems can guide students'

intentions and behaviours towards entrepreneurship (Roundy, Bradshaw & Brockman 2018). Entrepreneurship education literature suggests that stakeholder networks need to enable sharing of information, knowledge, experiences and resources for the benefit of students (Galvão et al. 2020). In contrast, current HEEE literature contains little knowledge of the interaction between students and various stakeholders. In particular, there needs to be research on how stakeholders influence students within the HEEE and the value addition for students.

HEEE studies by scholars including Secundo et al. (2020), Guerrero, Urbano and Gajón (2020) and Webber, Kitagawa and Plumridge (2020) have examined how factors prepare students for entrepreneurship by paying attention to individual-level aspects, such as students' entrepreneurial intentions and mindsets. The point of view that the HEEE is a multi-stakeholder environment (Rice, Feters & Greene 2014) that influences the development of students to pursue entrepreneurship has received considerably less attention among scholarly work. Stakeholders shape the flow of entrepreneurial knowledge and skills obtained by students (Spigel 2017; Rice, Feters & Greene 2014). Whether it is the home, institution or workplace, for the environment to function effectively as a context for development, it depends on the existence and nature of social interconnections (Bronfenbrenner 1979). More research is needed to explore how diverse stakeholders can engage with HEEEs that could influence students E&I capabilities in a resource-constrained environment.

1.5 Research questions and objectives

This research explores how HEEEs can develop students for entrepreneurship and innovation in a resource-constrained environment. In this case, exploration goes beyond the extant literature that investigated HEEEs for student start-ups, entrepreneurial mindset and intention. This research focuses on students' entrepreneurial development through HEEEs in a resource-constrained environment. First, the study intends to shed light on the continued development of HEEEs through the multiple views of diverse stakeholders with a deeper understanding of how HEEEs can contribute to their wider entrepreneurial ecosystem. Next, the study aims to provide new knowledge on how higher education institutions can design and evolve an environment (i.e. HEEE) for nurturing students' entrepreneurial development as envisioned by stakeholders. Finally, the study explores the role diverse stakeholders can play within the HEEE, in developing students for entrepreneurship.

Having recognised the above knowledge gaps in Section 1.4, this research shall examine the following research questions:

RQ1: How do diverse stakeholders anticipate the continued development of HEEEs in a resource-constrained environment?

RQ2a: What do diverse stakeholders perceive as the contextual factors of HEEEs that could influence students' E&I capabilities in a resource-constrained environment?

RQ2b: How and why do specific contextual factors of HEEEs influence students' E&I capabilities in a resource-constrained environment?

RQ3: How can diverse stakeholders engage in the factors of HEEEs that could influence students' E&I capabilities in a resource-constrained environment?

At the beginning of this study, the focus of the above research questions was on 'student entrepreneurial development' that include entrepreneurial intention, mindset and capabilities. After the data collection and analysis for the first research question, the focus of 'students E&I capabilities' emerged and this led to the revision of research questions including RQ2a, RQ2b and RQ3 refocusing on 'students E&I capabilities'.

Table 1.1 – Overview of research aim, questions and objectives

<p>What do you want to understand? → Research aim</p>	<p>How can higher education entrepreneurial ecosystems develop students for entrepreneurship in a resource-constrained environment?</p>		
<p>Why do you need to know this? → Research questions</p>	<p>RQ1: How do diverse stakeholders anticipate the continued development of HEEEs in a resource-constrained environment?</p>	<p>RQ2a: What do diverse stakeholders perceive as the contextual factors of HEEEs that could influence students E&I capabilities in a resource-constrained environment? RQ2b: How and why do specific contextual factors of HEEEs influence students E&I capabilities in a resource-constrained environment?</p>	<p>RQ3: How can diverse stakeholders engage in the factors of HEEEs that could influence students E&I capabilities in a resource-constrained environment?</p>
<p>→ Research objectives</p>	<p>To explore how diverse stakeholders anticipate the future of HEEEs in a resource-constrained environment. Specifically, the linkage between HEEEs with the wider entrepreneurial ecosystem at a system level.</p>	<p>To explore what diverse stakeholders perceive the composition of HEEEs that could influence students E&I capabilities in a resource-constrained environment, along with ‘how’ and ‘why’. Specifically, key drivers (i.e. contextual factors) for higher education management to implement at an institutional level.</p>	<p>To explore how diverse stakeholders can engage within the HEEE factors that could influence students E&I capabilities in a resource-constrained environment. Specifically, the stakeholder engagement that benefits students at an individual level.</p>

Source – adapted from Maxwell (2013, pp. 13–18)

1.5.1 Research development framework

At the beginning of an investigation, it is important to include a framework to guide research through its research questions and objectives, as Creswell and Creswell (2018) suggested. This research focuses on student entrepreneurial development. Student entrepreneurial development within an HEEE should be transformational, where they progress from a student to a graduate with the relevant knowledge and skills suitable for entrepreneurship (Nielsen & Gartner 2017), as depicted in Figure 1.2. This study intends to determine the composition of the HEEE that responds to this transformation in a resource-constrained environment. From which, the research will provide actionable insights evolving into a comprehensive HEEE by higher education institutions.

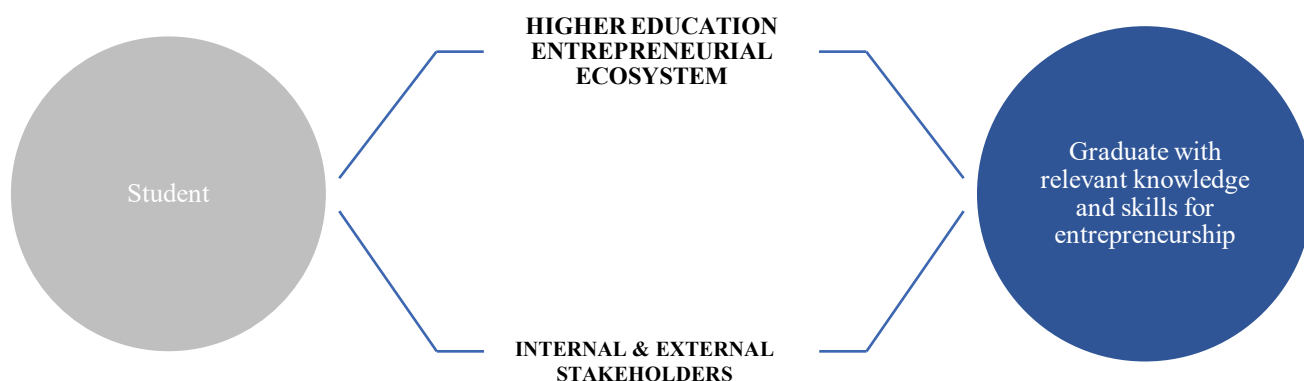


Figure 1.2 – Research development framework

1.6 Methodology

In this study, the reality is viewed as socially embedded, existing within the mind, and multiple and constantly changing (Grbich 2013). The goal is to seek an understanding of the world in which the problem prevails and to develop knowledge and meaning jointly through interaction between the researchers and the people who live and work within the researched space (Grbich 2013). This purpose recognises the interpretive framework of this study as social constructivism and the researcher inquires by starting with literature then moving to observations from participants to reach results (Creswell & Creswell 2018).

At the developing stage of the theoretical concept, there is a mix of methodologies among HEEE studies. A few studies including the work of Longva (2021), Miller and Acs (2017) and Rice, Fetters and Greene (2014) are qualitative in nature, while other investigations by Guerrero et al. (2020) and Meyer et al. (2020) have used a quantitative method. A recent study by Webber, Kitagawa and Plumridge (2020) adopted a mixed method. Given the prevailing research problem, questions and objectives, there is a need for in-depth exploration of HEEEs. Such a need for exploration and hearing diverse voices directs qualitative research (Creswell & Poth 2018). Qualitative research allows for unexpected development that may emerge as investigation begins from the exploratory research questions, and the outcome is unique models (Grbich 2007).

When exploring HEEEs, the perceptions and experiences of ecosystem actors are paramount in understanding the concept, which they are part of or relate to. Yet these actors that shape and operationalise the environment are yet to be heard as a whole representation. The majority of existing studies have investigated HEEEs either among internal stakeholders

or external stakeholders, with a few early exceptions having investigated HEEEs covering both groups. As one of the initial investigations of HEEEs focused on students' entrepreneurial development, this research plans to gather broader perspectives drawing participants who represent the wider entrepreneurial ecosystem. The qualitative interpretive research garners viewpoints from various stakeholders who can reflect on their real-world experiences and share their observations of working with students and graduates, providing external validity.

Given that literature on entrepreneurial ecosystems emphasises a systems approach (see Table 2.1), this study views HEEEs from a systems perspective. Based on the work on entrepreneurial ecosystems by Stam (2015), Feld (2012) and Isenberg (2010), various stakeholders were identified according to their relevance in the context. This study included deans/heads of schools (human capital domain), academics/educators (human capital domain), alumni entrepreneurs (market domain), established entrepreneurs (market domain), angel investors (financial capital domain) and support professionals (support domain). Taking a systems perspective, various actors of the HEEE and the local entrepreneurial ecosystem were interviewed in their specific roles for this exploratory research. In addition to their involvement in HEEEs, the selection of key external stakeholders was based their interest on supporting young entrepreneurs and contributing to new start-ups. In doing so, this study brings broader perspectives through 40 semi-structured interviews with participants from six diverse stakeholder groups, representing key stakeholders of the HEEE and their entrepreneurial ecosystem. The study is based on the private higher education sector in Sri Lanka, which has minimum involvement from the government.

1.7 Scope and limitations

While this research is focused on a specific problem and plans to contribute to original knowledge, the study has a clear scope. This section defines the scope of investigation in this research, establishing what this study is not about and the boundaries are drawn underlining the theoretical concept and geographic context.

1.7.1 Theoretical concept

This study contributes to the field of entrepreneurship. The theoretical concept under investigation in this research is the 'higher education entrepreneurial ecosystem' of higher education institutions. HEEEs serve a two-fold function of (1) delivering entrepreneurship education and (2) supporting the development start-ups and new ventures (Rice, Feters & Greene 2014). The research investigates the whole HEEE that includes both functions, as

entrepreneurship education alone will not sufficiently impact student entrepreneurs or entrepreneurial activity as relevant entrepreneurial support is required (O'Brien, Cooney & Blenker 2019). Therefore, this research is not limited to 'entrepreneurship education ecosystems' where scholars explore courses, curriculum, co-curriculum, pedagogy, assessments and educators (Ligouri et al. 2020; Brush 2014) nor is the study restricted to entrepreneurial support that examines incubators and accelerators (Guerrero et al. 2020; Theodoraki et al. 2018). The scope explores HEEEs as a whole, considering their contextual factors and actors in the view of entrepreneurship education and entrepreneurial support. Finally, HEEEs are associated to their entrepreneurial ecosystems that promotes new venture creation and not necessarily innovation systems that encourages innovation outputs.

Further, the growing consensus is that HEEEs co-created and managed by higher education institutions (Wright, Siegel & Mustar 2017) compared to other ecosystems originally formed by students as a movement towards entrepreneurship. Studies related to HEEEs over the last decade have emphasised the university as an institution (Lahikainen et al. 2019; Heaton 2019) and on students (Webber, Kitagawa & Plumridge 2020). The HEEE supports its higher education community including students, alumni and staff with identifying, developing and commercialising entrepreneurial and innovative initiatives (Guerrero et al. 2018). However, this study is focused on HEEEs co-created by higher education institutions for their student community, recognising their importance as youth creating value and contributing to the economy and society.

1.7.2 Geographic context

This study is based on Sri Lanka, an emerging ecosystem where entrepreneurship is a national priority for sustainable development. Sri Lanka has a tiered higher education structure comprising public universities and private higher education institutions providing tertiary education (Dissanayake 2020). The Ministry of Sustainable Development (2018) reported that the Sri Lankan public higher education sector is currently facing several challenges. First, higher education lacks quality, specifically in the line of promoting entrepreneurship and developing students for such a career during their higher education (Ministry of Sustainable Development 2018). Second, limited access to higher education is a challenge for students in Sri Lanka as only 18% of the 20- to 24-year-old population is enrolled in the public higher education sector due to national resource constraints (Ministry of Sustainable Development 2018).

Due to capacity constraints and lack of funding and resources constraining the public sector, there is growing importance on the private higher education section. According to the Sri Lanka Export Development Board (2018) approximately 11,000 students enrol at private higher education institutions for paid undergraduate education every year. These enrolments represent 25% of the total undergraduate enrolments of the public higher education sector. Private higher education institutions deliver undergraduate study programs affiliated to universities in the US, UK, Australia and Canada (Gamage & Wijesooriya 2012). In essence, these private higher education institutions are validated to run the same study programs while providing a similar university experience for their students. Therefore, this study is based on private higher education institutions where HEEEs are relevant, setting a clear boundary for the study.

1.8 Structure of dissertation

This PhD thesis is a cumulation of 10 chapters. They include introduction, literature review, theoretical framework, contextualisation, research design, findings and analysis addressing research question 1, findings and analysis addressing research question 2a, findings and analysis addressing research question 2b, findings and analysis addressing research question 3, and discussion and conclusions.

Chapter 1 introduces the research of this study. The introduction establishes the situation demonstrating that HEEEs are an area of research worthy of investigation, and identifies the problem with specific knowledge needs, research questions and objectives, and the means of arriving at the solution by contributing new understanding and knowledge. Chapter 2 presents a comprehensive review of scholarly work related to HEEEs, including a definitional analysis to establish the consistencies and contrasts within the various versions of HEEE definitions and explanations. This is followed by an integrated review of scholarly work relating to HEEEs that results in the current state of HEEE research, along with academic debates after scanning 67 articles from a total of 991 articles between 2000 and 2020. Chapter 3 offers the context of this study with a detailed overview of Sri Lanka and its higher education sector while framing Sri Lanka as a resource-constrained environment. Chapter 4 provides the theoretical framework for this study including the use of theory in current HEEE studies and the four theoretical lenses. Chapter 5 explains the philosophy and researcher values followed by a justified account of data collection and analysis along with ethical considerations. This chapter illustrates the need for qualitative methodology, justifying the benefits including rich

details and depth of ‘how’ and ‘why’ for this research and the area of research. Chapters 6 to 9 present the empirical findings of this study in a systematic and detailed way. Chapter 6 reports findings extracted from interview data that responds to the first research question on continued development of HEEEs, including excerpts and a reorder matrix. Research questions 2a, 2b and 3 were revised after this chapter to focus on students E&I capabilities which emerged in this chapter. Chapter 7 presents and describes the findings supported by excerpts and a spectrum display associated with the second research question. This qualitative research also produced deeper findings on the ‘how’ and ‘why’ of HEEEs factors, presented in Chapter 8. Chapter 9 reports findings addressing the final research question on stakeholder engagement and its value for students keen on an entrepreneurial career. Chapter 10 is the closing chapter of this study including a discussion and conclusion together with the theoretical contributions and practical implications. This chapter will also propose future research from the questions that emerged from this research.

1.9 Chapter summary

This introductory chapter gives an insightful overview of the research’s theoretical background and shows the increasing importance and growing attention the area of research has recently received. The chapter also positions this study in the field of research, by showing the current literature and what is known so far, clarifying the gap to be covered and discussing the research design. The section on scope and limitation clearly defines the theoretical concept and geographical context in focus. The chapter highlights that HEEEs are an under-researched area, despite having important consequences in the practical world. According to recent work by Delanoë-Gueguen and Theodoraki (2021), Hsieh and Kelley (2020) and Longva (2021), HEEEs are in the early stage of development, with a lack of understanding of their composition and configuration in serving their purpose. Current research mainly emphasises developing HEEEs for producing student start-ups, and more recently, scholars have turned to students’ entrepreneurial mindset and intention. Followed by the importance of HEEEs in entrepreneurship, this chapter argues the need for facilitating student entrepreneurial development within HEEEs.

Extant HEEE literature has found a broad list of HEEE factors contributing to the composition of HEEEs. Most studies in the field of HEEE have only focused on student start-ups, entrepreneurial mindset and intention in developed countries. There is minimum previous research that has investigated HEEE towards student entrepreneurial development within

HEEEs, even though there is a great deal of importance expressed on the student knowledge and skill required for taking on an entrepreneurial career. This thesis is one of the empirical studies set to explore the contextual factors and actors of HEEEs through a student development lens in a resource-constrained context. The study is concentrated on Sri Lanka with a focus on undergraduates of private higher education institutions. This research is exploratory and interpretative in nature using a qualitative approach.

To diagrammatically frame this PhD thesis, Luker’s (2008) bedraggled daisy is applied below. Figure 1.3 is a Venn diagram representing the sets of eight different elements with the key interest investigated in this study at the centre.

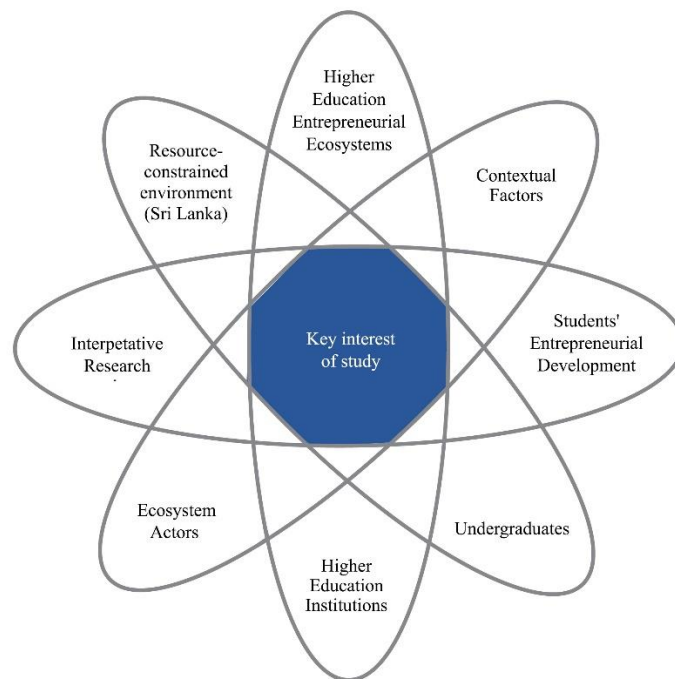


Figure 1.3 – Key interests of this study

CHAPTER 2: LITERATURE REVIEW

2.1 Chapter overview

For decades, scholars have debated on how higher education institutions could play a prominent role in economic development and social change, and there has been great interest in the entrepreneurship and management literature (Klofsten et al. 2019). However, the historical, theoretical and empirical foundations of HEEEs are recent (Longva 2021; Hsieh & Kelley 2020).

The literature review creating the case for this study comprises five distinct sections as systematically structured in Figure 2.1 below. This chapter analyses the current scholarly work to recognise key contributions to HEEEs and determine gaps that exist in the literature using an integrated literature review approach. In doing so, the integrative review of HEEE literature includes 67 articles from a total of 991 articles from three-independent e-databases (Scopus, EBSCOhost and Web of Science) as leading management and entrepreneurship journals. The initial search period was set between 2000 to 2020 to bring together the work within these two decades. In particular, the articles emerged from top tier journals including *Small Business Economics*, *Entrepreneurship Theory and Practice*, *Entrepreneurship and Regional Development*, the *Journal of Management and Higher Education*. To include the most recent articles in 2021 and 2022 to this literature chapter, a second search was conducted among the same e-databases. Given that HEEE is a contemporary concept, this chapter provides a review underpinning literature in the field, related to and specifically on HEEEs.

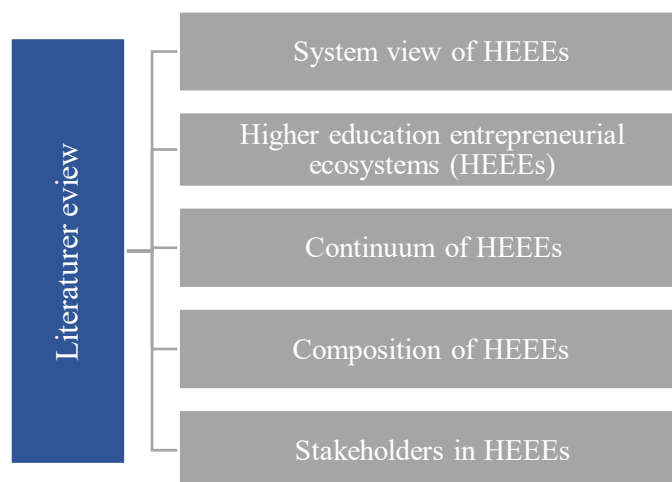


Figure 2.1 – Chapter 2 outline

2.2 System view of HEEEs

2.2.1 Sub-ecosystem of entrepreneurial ecosystem

Systematic empirical evidence demonstrates the power entrepreneurial ecosystems have in enhancing entrepreneurship (Audretsch et al. 2021; Stam 2018). The roots of entrepreneurial ecosystems are primarily credited to various scholars including Neck et al. (2004), Cohen (2006), Isenberg (2011), Feld (2012) and Stam (2015). Entrepreneurial ecosystems as a phenomenon have gained enormous popularity within research, practice and policymaking over the last decade (Wurth et al. 2021). This phenomenon was quickly adopted by government and non-government organisations such as the Organisation for Economic Co-operation and Development (OECD) (2021) and the World Economic Forum (2014). The idea is that the entrepreneurial ecosystem surrounding the process supports and provides resources for entrepreneurs towards entrepreneurial activity (Spigel 2016; Stam 2015). To develop and support entrepreneurial individuals igniting entrepreneurship, entrepreneurial ecosystems are the most potent force around the world – in both developed and developing countries (Isenberg 2010).

In early studies, entrepreneurial ecosystems were defined by Cohen (2006, p. 3) as “an interconnected group of actors in a local geographic community committed to sustainable development through the support and facilitation of new sustainable ventures”. Since then, several scholars have added new perspectives through their definitions, emphasising different features enhancing the phenomenon (refer Table 2.1). When considering their composition, some definitions are inclined towards the ‘factors’ of the entrepreneurial ecosystem, while others are focused on the ‘actors’ (Roundy, Bradshaw & Brockman 2018; Acs et al. 2017; Mason & Brown 2017; Cohen 2006). For this research, the nature of an entrepreneurial ecosystem is inspired by Stam and Spigel (2016, p. 1) and understood as “as a set of interdependent actors and factors coordinated in such a way that they enable productive entrepreneurship within a particular territory”. This definition resonates well with this research as it highlights the composition of an entrepreneurial ecosystem, including a combination of factors and actors in a given geographic context.

Table 2.1 – Definitions of entrepreneurial ecosystems among scholarly work

Year, page	Scholars	Definition
2018, p. 5	Roundy, Bradshaw & Brockman	A self-organised, adaptive and geographically bounded community of complex agents operating at multiple, aggregated levels, whose non-linear interactions result in the patterns of activities through which new ventures form and dissolve over time.
2017, p. 50	Spigel	Entrepreneurial ecosystems are combinations of social, political, economic and cultural elements within a region that support the development and growth of innovative start-ups and encourage nascent entrepreneurs and other actors to take the risks of starting, funding and otherwise assisting high-risk ventures.
2017 p. 479	Acs et al.	A National System of Entrepreneurship is the dynamic, institutionally embedded interaction between entrepreneurial attitudes, ability and aspirations, by individuals, which drives the allocation of resources through the creation and operation of new ventures.
2017, p. 120	Kuratko et al.	Entrepreneurial ecosystem as coordinated attempts to establish environments that are conducive to the probabilities of success for new ventures following their launch ... entrepreneurial ecosystems are focused on creating environments conducive to the success of entrepreneurs and their new venture.
2017, p. 98	Auerswald & Dani	Represents the higher-level infrastructure that enables interactions between the entrepreneurial agents and institutions in the industrial sector ... They cut across industries and focus on the environment surrounding entrepreneurs – with entrepreneurs and entrepreneurship clearly at the centre.
2017, p. 1	Bruns, Bosma, Sanders & Schramm	Entrepreneurial ecosystem as a multidimensional set of interacting factors that moderate the effect of entrepreneurial activity on economic growth.
2016, p. 2	Audretsch & Belitski	Institutional and organisational as well as other systemic factors that interact and influence the identification and commercialisation of entrepreneurial opportunities.
2015, p. 1765	Stam	The entrepreneurial ecosystem is a set of interdependent actors and factors coordinated in such a way that they enable productive entrepreneurship.
2014, p. 5	Mason & Brown	A set of interconnected entrepreneurial actors (both potential and existing), entrepreneurial organisations (e.g. firms, venture capitalists, business angels, banks), institutions (universities, public sector agencies, financial bodies) and entrepreneurial processes (e.g. the business birth rate, numbers of high growth firms, levels of ‘blockbuster entrepreneurship’, number of serial entrepreneurs, degree of sell-out mentality within firms and levels of entrepreneurial ambition) which formally and informally coalesce to connect, mediate and govern the performance within the local entrepreneurial environment.
2012, p. 25	Regele & Neck	The interaction of people, roles, infrastructure, organisations and events creates an environment for heightened levels of entrepreneurial activity.
2010, p. 43	Isenberg	The entrepreneurship ecosystem consists of a set of individual elements – such as leadership, culture, capital markets and open-minded customers – that combine in complex ways.
2006, p. 3	Cohen	Sustainable entrepreneurial ecosystems are defined as an interconnected group of actors in a local geographic community committed to sustainable development through the support and facilitation of new sustainable ventures.

There is deep understanding of entrepreneurial ecosystems in terms of their components and configuration. Entrepreneurial ecosystem was characterised by conditions/elements, outputs and outcomes as a system (Stam and Spiegel 2016) and are conceived as closely connected (Feldman, Siegel and White 2019). These structural components are consistent in the practical context where the Global Entrepreneurship Monitor draws their conceptual framework including inputs, such as entrepreneurial activity, that lead to outputs and outcomes. This view has transferred from the field of economics, which is about systems that explain outputs and outcomes (Acs et al. 2017). Thus, entrepreneurial ecosystems are developed through the lens of systems theory investigating entrepreneurial ecosystems as a whole rather than a sum of components (Bischoff et al. 2018; Audrestsch & Belitski 2017).

Entrepreneurship scholarly work advocates a holistic approach by focusing on the role of the entrepreneurial ecosystem and their domains to nurture and sustain entrepreneurs (Audrestsch et al. 2017; Autio et al. 2014). Among the various entrepreneurial ecosystems, ‘human capital’ is a common factor (refer Table 2.2). The economist Adam Smith (1776) considered human capital as an asset of economic value, which led to academic interest in the economic effects of human capital. Human capital is considered one of the six domains in Isenberg’s (2016) entrepreneurial ecosystem. Human capital represents the talent, including entrepreneurs and individuals skilled with entrepreneurship, that appears as an element among entrepreneurial ecosystems as suggested by Stam (2015), Feld (2012), Cohen (2006) and Neck et al. (2004). Educational institutions are acknowledged as the source of this talent and are connected to the entrepreneurial ecosystem (Feld 2012).

Table 2.2 – Key entrepreneurial ecosystems theoretical frameworks

Scholars	Theory	Methodology	Elements/factors of entrepreneurial ecosystems
Stam (2015)	System approach	Conceptual	Networks, leadership, finance, talent, knowledge, support services/intermediaries, demand, physical infrastructure, culture and formal institutions.
Feld (2012)	System approach	Conceptual	Leadership, intermediaries, network density, government, talent, support services, engagement, companies and capital.
Isenberg (2011)	System approach	Conceptual	Policy, finance, culture, supports, human capital and markets.
Cohen (2006)	System approach	Conceptual	Informal network, formal network, university, government, professional and support services, capital services and talent.
Neck et al. (2004)	System approach	Empirical	Incubator organisations, informal and formal networks, university, government, support services, capital, talent pool, large corporations, physical infrastructure and culture.

2.2.2 Entrepreneurial initiative of universities

The impact of universities can vary considerably within a city, region and country (Spigel & Wright 2015). Although the dominant role of universities is acknowledged as producing qualified employees, these institutions are natural incubators due to their responsibility in teaching, research and contributing to entrepreneurship (Etzkowitz & Kolfsten 2005). Higher education institutions, including universities, have been considered as critical stakeholders of the entrepreneurial ecosystem (Startup Genome 2020). Scholars such as Isenberg (2011), Cohen (2006) and Neck et al. (2004), explicitly listed the university as one of the components in the entrepreneurial ecosystem (refer Table 2.2 above). Entrepreneurial universities are positioned as the engines of the knowledge economy (Nelles & Vorley 2010) that fosters entrepreneurship, shaping the wider entrepreneurial ecosystem (Fischer et al. 2018; Wadee & Padayachee 2017; Miller & Acs 2017; Kuratko 2016; Haase & Lautenschläger 2011; Etzkowitz & Leydesdorff 2000; Drucker 1985). There is strong evidence in developed economies that higher education institutions are the ‘hearts’ of these environments, being a valuable source of entrepreneurship (Fischer et al. 2018; Miller & Acs 2017; Stam 2009; Etzkowitz 1998). Entrepreneurial universities are one of the most influential ecosystem stakeholders in nurturing new entrepreneurs. This means that entrepreneurial universities have a wider scope, progressing from a traditional knowledge generator to an entrepreneurial ecosystem enabler (Trivedi 2016).

Entrepreneurial universities as a concept can be traced to the early 1980s where they emerged as natural incubators providing support to foster entrepreneurship and innovation for the university community including students, staff and alumni (Guerrero & Urbano 2012). An entrepreneurial university is one that undertakes multiple missions for teaching, research and entrepreneurial initiatives playing a prominent role in socio-economic development (Etzkowitz 2014). In broad terms, entrepreneurial universities have the responsibility of creating entrepreneurial capital including the future entrepreneurial behaviour of students (Audretsch 2014). Universities are expected increasingly to engage in a ‘third mission’ by becoming entrepreneurial in response to policy implications led by the US and spreading to the UK and Europe (Philpott 2011; Gibb 2005). These universities draw on unique conditions and resource endowments in their environments which influences their capability to be ‘entrepreneurial’ (Bedő, Erdős & Pittaway 2020).

Entrepreneurial universities are educating students, attracting researchers, encouraging new venture creations, facilitating knowledge transfers, and promoting entrepreneurial culture

to shape and supporting entrepreneurial ecosystems (Miller et al. 2018; Guerrero et al. 2016). As entrepreneurial universities foster a supportive environment that encourages entrepreneurial activity among students and staff, ecosystems are a key element of entrepreneurial universities (Secundo et al. 2020; Hannon 2013; Guerrero & Urbano 2012). In this view, entrepreneurial universities face multiple strategic challenges concerning strategic priorities, contextual factors, and processes such as entrepreneurial teaching and learning and measurement metrics (Cunningham & Miller 2021; Forliano et al. 2021; Klofsten et al. 2019; Etzkowitz et al. 2019). To address these challenges, entrepreneurial universities need to develop their own internal processes, policies, systems and infrastructure (Kirby 2004; Wright, Siegel & Mustar 2017). A ‘one-size-fits-all’ approach that considers universities as homogeneous institutions is unrealistic as every institution is unique in its environment (Degl’Innocenti et al. 2019; Benneworth et al. 2016).

2.2.3 Co-creation of HEEEs

The role of higher education institutions is emerging to be dichotomous. Higher education institutions contribute to economic growth and social development by designing and developing their ecosystem (Guerrero and Urbano 2016). Within a highly competitive higher education sector, every university seeks a unique approach to entrepreneurship and higher education institutions are considering entrepreneurial pathways to becoming entrepreneurial. Entrepreneurial pathways are strategic choices that higher education institutions undertake to demonstrate their commitment and involvement with E&I initiatives within the institution (Klofsten et al. 2019). Studies across the world divulge that higher education institutions are co-creating their own entrepreneurial ecosystems, enacting on the third mission (Guerrero, Urbano & Gajón 2017). HEEEs are co-created as a proactive response to entrepreneurial or education initiatives, or they might emerge as reactive responses to specific gaps in entrepreneurial or education development (Rice, Feters & Greene 2014).

Babson College was one of the first entrepreneurial universities to be recognised in the literature for their leading initiative in developing an entrepreneurial ecosystem for the university community (Feters, Greene & Rice 2010). Isenberg (2016) criticised this as ‘the creation mistake’, meaning ecosystems are not designed or created. However, the growing consensus is that university-based entrepreneurship ecosystems are co-created by entrepreneurial universities along with stakeholders (Wright, Siegel & Mustar 2017). Creating a fully developed comprehensive HEEE takes at least two decades, in a dynamic and non-linear process according to Rice, Feters & Greene (2014). In 2010, when the concept of university-

based entrepreneurship ecosystems emerged through the work of Feters, Rice and Greene (2010) based on the Babson Collage's entrepreneurship ecosystem, this was a result of more than 30 years of creating a unique entrepreneurial community for higher education.

Reference made to university-based entrepreneurship ecosystems is multifaceted. Some 17 different terms emerged in the scholarly work referring to the same university-based entrepreneurship ecosystems. These terms are interchangeably used where scholars refer to the same concept and this is likely to lead to a research overlap in the field. When analysing the literature in this review, it came to light that 'university-based entrepreneurship ecosystem' was the most widely represented term in scholarly work. This could be due its roots in the first conceptualisation by Feters, Rice and Greene (2010). Other references to the ecosystem are 'university entrepreneurial ecosystem', 'university ecosystem', 'university-centred entrepreneurship ecosystem', 'innovation and entrepreneurship ecosystem', 'university business cooperation ecosystem', 'entrepreneurial university ecosystem', 'university environment and support system', 'academic entrepreneurial ecosystem', 'university-driven entrepreneurship ecosystem', 'research university entrepreneurial ecosystem', 'university-wide entrepreneurship ecosystem', 'ecosystem for student start-ups', 'engagement, employability and employment ecosystem', 'higher education entrepreneurial ecosystem', and 'learning and entrepreneurship ecosystem'. Outside of the integrative review, it was found that entrepreneurial ecosystems in the higher education context was emerging to be referred as 'university innovation and entrepreneurial ecosystems'.

The term 'higher education entrepreneurial ecosystem' was suggested by Guerrero, Urbano and Gajon (2017) when investigating the context of an emerging economy, Mexico. HEEEs seems more suitable to contexts where the higher education sector is a representation of universities and other education institutions. Not all countries have mirrored this type of education system. In developing countries, where government funding is limited, higher education is provided by a lower number of public universities and more private higher education institutions. Contrary to this, in developed countries, higher education is dominated by universities and the terminology 'university-based entrepreneurship ecosystem' is suitable.

Given that this study is undertaken in the context of a developing country, key terms used in this research may be different to a developed country. Previous studies, such as by Kasturiratne, Lean and Phippen (2012) on entrepreneurship education in Sri Lanka, used the term 'higher education institution'. Throughout this study, an entrepreneurial university is

referred to as higher education institution and a university-based entrepreneurship ecosystem is referred to as a higher education entrepreneurship ecosystem (HEEE), making it more relevant to the private higher education system in Sri Lanka. As mentioned, HEEE was used by Guerrero, Urbano and Gajón (2017) for a study on HEEEs in Mexico, an emerging economy.

Higher education institutions along with their HEEEs belong to wider entrepreneurial ecosystems and attract resources from stakeholders at local, regional, national and international levels (Webber, Kitagawa & Plumridge 2020). If higher education institutions focus on E&I, the successes and benefits of the transformational process should be profound for the broader community (Matriz et al. 2020; Birch et al. 2017). The link between HEEEs and their wider entrepreneurial ecosystems are significant because students who pursue entrepreneurship affect the entrepreneurial ecosystem through job creation, innovation, knowledge creation and economic dynamism (Maezocchi et al. 2019). The interrelations between entrepreneurial ecosystems and HEEEs are relevant as both ecosystems regulate the entrepreneurial activity that contributes to economic development and social change (Wright, Siegel & Mustar 2017).

2.3 Higher education entrepreneurial ecosystems

Entrepreneurial ecosystems within higher education gained prominence from the work of Fetters, Greene and Rice (2010) and their book *The Development of University-Based Entrepreneurship Ecosystems*. The book provided global insights into framing, designing, launching and sustaining entrepreneurial efforts through HEEEs framed as a support context in which E&I can thrive (Fetters, Greene & Rice 2010). To introduce the topic on HEEE, this section reviews the recent history and evolving definitions, growth of scholarly work, geographic spread, theoretical framing of existing studies, methodology applied, the nexus of entrepreneurship education and entrepreneurial support, the co-creation of HEEEs and the sub-ecosystems of HEEEs.

2.3.1 Emergence and definitions

The sub-ecosystem HEEE has been introduced recently to support entrepreneurship in the context of higher education. Scholars such as Brush (2014) acknowledge the work of Fetters, Greene and Rice (2010) as the initial conceptualisation of HEEEs. This scholarly work was a case study of six universities that led to seven success factors for developing university-based entrepreneurship ecosystems (Rice, Fetters & Greene 2014). Since then, more scholars have

joined the pursuit for factors that form a comprehensive, highly evolved university-based entrepreneurship ecosystem, with contextual relevance (Stam & Spigel 2016).

When theorising about entrepreneurship, scholars Bygrave and Hofer (1991, p. 13) said “good science starts with good definitions”. Examining scholarly work found that HEEE lacks a common definition (Bock et al. 2020). The initial study that proposed HEEEs by Greene et al. (2010, p. 2) expressed HEEEs as “multidimensional enterprises that support entrepreneurship development through a variety of initiatives related to teaching, research and outreach”, identifying it as a set of organisations. This notion advanced to HEEEs as “an extraordinarily resource-rich, comprehensive and dynamic context for delivering entrepreneurship education and for supporting the start-up and development of new ventures” (Rice, Fetters & Greene 2014, p. 177), which established their context and functions. Being an evolving concept, the theoretical development of HEEE is in its early development stages, where HEEEs are novel and emerging (Longva 2021; Hsieh & Kelley 2020). Drawing on scholarly work, other scholars in the field have expressed HEEEs in a similar way, as shown in Table 2.3.

Table 2.3 – Definitions of HEEEs among scholarly work

Year	Scholars	Definition
2020	Bock et al.	A set of actors that engage with regional and national innovation ecosystems through relationships with the industry
2020	Webber, Kitagawa & Plumridge	Organisational capabilities, resources and, ultimately, the entrepreneurial knowledge provided by the university, with characteristics associated with both research and teaching missions
2018	Gomesde et al.	An interconnected network of actors (individuals, groups and organizations) that cooperate in formal and informal ways in order to create value
2019	Belitski	A context of a specific school, university and entrepreneurial ecosystem, and defined within a specific business environment
2014	Rice, Fetters & Greene	An extraordinarily resource-rich, comprehensive and dynamic context for delivering entrepreneurship education and for supporting the start-up and development of new ventures
2010	Fetters, Greene & Rice	Multidimensional enterprises that support entrepreneurship development through a variety of initiatives related to teaching, research and outreach

From the above definitions, HEEEs are characterised primarily by the stakeholders (e.g. multidimensional enterprises, set of actors) within a specific context that may contribute to their functioning of delivering entrepreneurship education and supporting start-ups (refer Table 2.3). In contrast, entrepreneurial ecosystems are broadly understood as a set of factors

and actors within a particular territory (Stam 2015). This comparison shows that ‘factors’ are not explicitly included in the HEEE definitions, although studies investigating entrepreneurship ecosystems in higher education suggest lists of factors (Miller & Acs 2017; Rice, Fetters & Greene 2014). Hence, there is scope to address this gap in the HEEE definition.

2.3.2 Growth of HEEE scholarly work

Although the search period for this literature review began from 2000, the first article that surfaced was dated to 2010. This first article, published by Fetters, Greene and Rice (2010), appears to be a notable contribution to HEEEs. The article is cited by various scholars exploring HEEEs, such as Delanoë-Gueguen and Theodoraki (2021) and Webber, Kitagawa and Plumridge (2020). During the period of 2011 to 2013 inclusive, as well as in 2015, no articles emerged. In 2014, there were two articles and one of these was an extension of the first contribution involving the same scholars – Rice, Fetters and Greene (2014). This article is another noteworthy effort, garnering 42 citations since publication. These two articles seem to have stimulated interest among scholars in this area, as since 2016 there has been a significant growth of scholarly work focused on HEEEs.

2.3.3 Geographic spread of HEEE scholarly work

The majority of articles found during this literature review were based on a single country while a few articles investigated multiple countries (i.e. more than two). Articles related to and on HEEEs covered more than 33 different countries. The roots of entrepreneurship education traced back to the US (Katz 2003) and the spread of publications on HEEE began in the US (Kirby 2004). This trend has continued, where the US remains the most researched geographic context for HEEEs, with over 12 articles published within a decade.

In Figure 2.2, it becomes evident that the extant research is mostly based on developed (high income) countries such as the US, UK and Spain, resulting in an imbalanced spread of HEEE research across the world. This is consistent with the paucity of research on graduate entrepreneurship in developing countries as suggested by Nabi and Linan (2011). Among the results, HEEE-related articles are almost non-existent on developing countries such as Algeria, Bhutan, Cambodia, Ghana, Kenya, Nepal, Sri Lanka, Vietnam and Zimbabwe, which are classified as lower-middle income countries and emerging economies by the World Bank (2020). The lack of research on emerging economies is not rational as entrepreneurship is known to facilitate the developing-to-developed country transition (Masakure, Henson & Cranfield 2009).

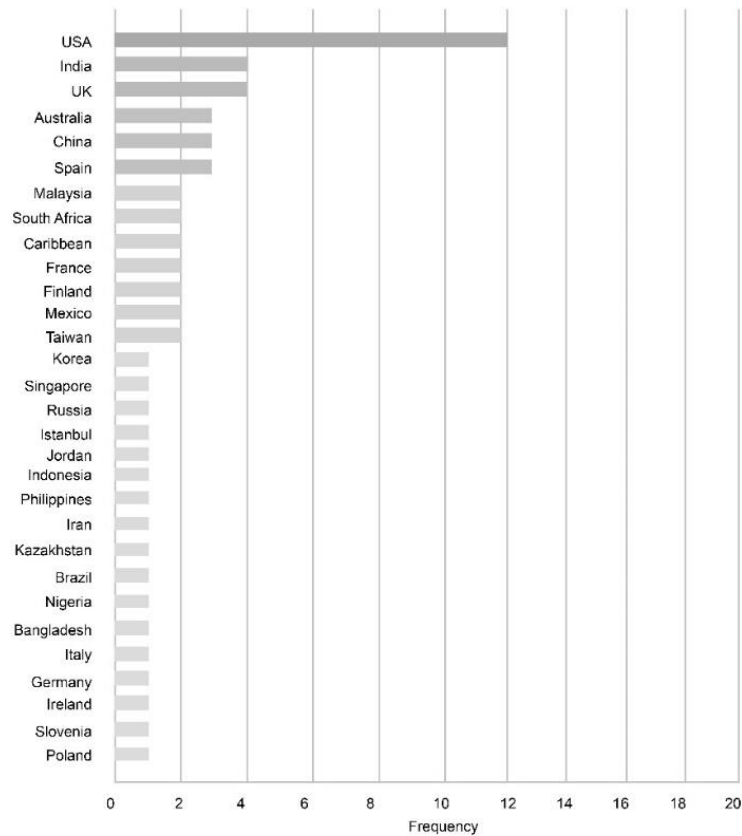


Figure 2.2 – Countries studied in HEEE literature

Although the current century is termed the ‘Asian Century’ (Walmsley 2018), the extent of HEEE research focused on exploring Asian countries is minimal. For instance, this review reports three articles in Malaysia, two in Taiwan and just one article each in Asian countries such as South Korea, Singapore, Indonesia, Bangladesh and the Philippines. However, when classified and analysed as continents, in Figure 2.3, most of the research was found in the Asian context with 25 of 67 articles, followed by Europe and North America. A high number of 15 Asian countries were studied as the context compared to 10 European countries and four countries in North America. The least representation is reported by South America, Australia and Oceania, and Africa.

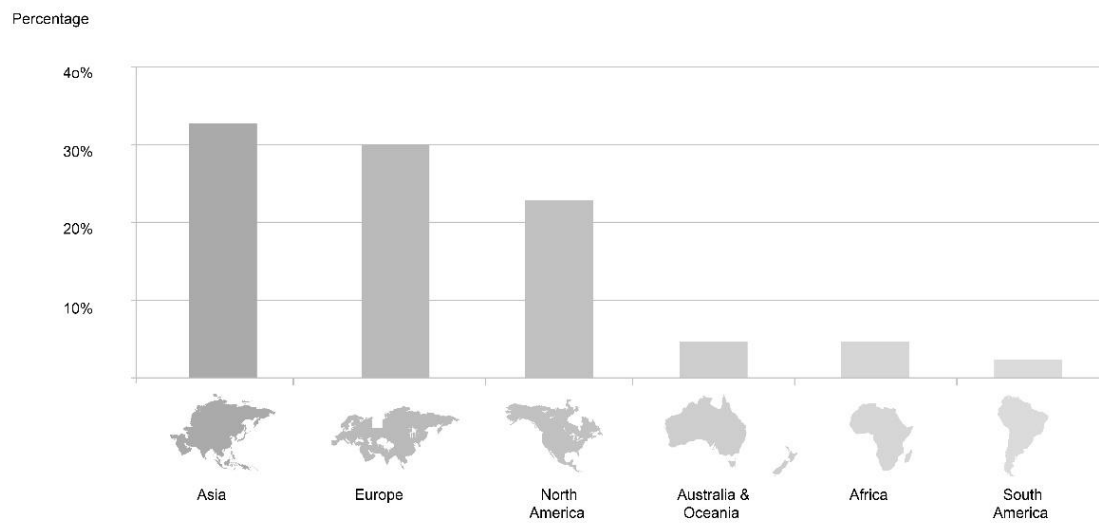


Figure 2.3 – Continents represented by previous HEEE studies

2.3.4 Framing of HEEE scholarly work

The integrative review extended to understand the underlying theories of HEEE studies among the 67 articles. Studies have been developed using various theories taking different perspectives. In investigating the composition of HEEE for student start-ups, scholars have applied theories ranging from the resource-based view (Fetters, Greene & Rice 2010), Turner’s frontier thesis (Miller & Acs 2017), the triple helix (Shil et al. 2020; Allahar & Sookram 2019) to social network theory (Longva 2021). For students’ entrepreneurial intention, studies have undertaken the theory of planned behaviour (Webber, Kitagawa & Plumridge 2020) and the utility-maximising function (Guerrero, Urbano & Gajón 2020).

This review reveals that studies exclusive to the function of entrepreneurship education have involved theories such as stakeholder theory (Bischoff 2018), learning theories (Middleton et al. 2019) and student involvement theory (Bock et al. 2020) to discover the composition of HEEEs.

Lastly, by looking at the current state of HEEE research, it was evident scholars paying attention to entrepreneurial support utilised institutional theory (Lahikainen et al. 2019), social capital theory (Theodoraki, Messeghem & Rice 2018) and the theory of planned behaviour (Guerrero, Urbano & Gajón 2017). There is a trend of multiple theories being used to frame and investigate HEEE studies, even when focusing on the area of study, instead of building on one suitable theory leading to deeper contribution.

Reviews support the need for qualitative, quantitative or mixed studies establishing the research on previous scholarly work (Rocco & Plakhotnik 2009). This review indicates 40% qualitative, 28% quantitative, 21% mixed and 12% conceptual with a high extent of 88% of research being evidence-based publications. Research on HEEEs is predominately undertaken using qualitative methodology and second by quantitative methodology. Although the mixed methodology is known to combine the strengths of qualitative and quantitative methodologies (Johnson, Bock & George 2019; Ricci et al. 2018), mixed methodology is the least conducted by entrepreneurship scholars in the HEEE literature.

Next, the dataset was analysed to determine the most frequently used data collection methods. In most instances, a single method was utilised in the articles while there were some instances when multiple methods were applied, such as two qualitative methods (observations and focus group discussions) or mixed methods of quantitative and qualitative. Although qualitative methodology is most widely practiced by scholars investigating HEEEs, the survey questionnaire (28 of 67 articles) is the most represented among quantitative and mixed-method methodology, closely followed by interviews (26 of 67 articles). As methods, survey questionnaires and interviews are the leading methods among the 67 articles. The use of secondary data, such as public databases, shows more popularity over documents, observations and focus groups in HEEE research. Quantitative methods have only used survey questionnaires while qualitative methods have applied, respectively, interviews, secondary data, documents observations and focus groups.

Among the articles in the review, representation of voice considered in the investigation was determined. Most of the time, multiple groups of participants were investigated rather than a single category of participants such as students or faculty. Although the HEEE context is a multi-stakeholder environment (Belitski & Heron 2016; Autio et al. 2014; Fetters, Greene & Rice 2010), the review reveals that studies have paid greater attention to capture internal views and investigated HEEEs among members of the university. Investigations are most common among faculty, students and the university as participants with 16 of 67 articles each (refer Figure 2.4). Start-up founders and entrepreneurs rank as the second most investigated participants among 10 of 67 articles. External stakeholders such as alumni entrepreneurs are discussed as key contributors of entrepreneurial education and support provision (Meyer et al. 2020), yet their participation is minimal as the unit of analysis, with just three of 67 articles. More studies investigate current students with a focus on the intended behaviour of ‘becoming

an entrepreneur’. Considering the extant literature, studies lack the representation of diverse stakeholders in exploring HEEEs.

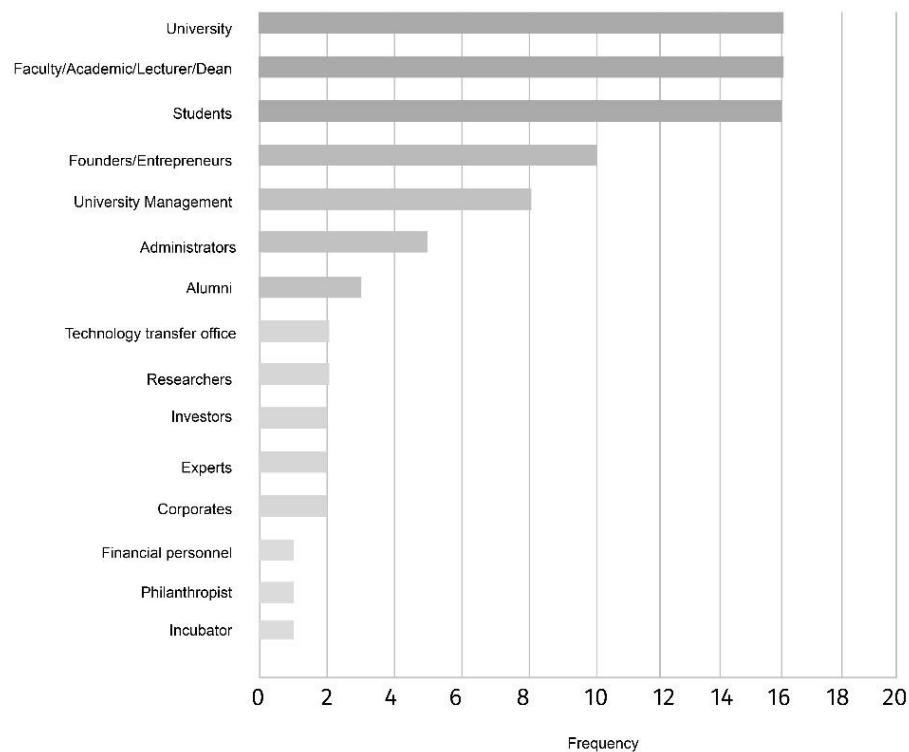


Figure 2.4 – Participants investigated in previous HEEE studies

2.3.5 Nexus of entrepreneurship education and entrepreneurial support

When analysing scholarly work on HEEE, two dominant lineages emerged – ‘entrepreneurship education’ and ‘entrepreneurial ecosystem’. The first, entrepreneurship education, refers to any education program aimed at developing entrepreneurial knowledge, skills and attitude among students (Fayolle 2006; Katz 2003). Scholars such as Kuratko (2005) argue this entrepreneurship education to be different from typical business education. Following the well-known debate on whether entrepreneurship can be taught, we have established that entrepreneurship education is an accepted discipline perceived to develop an entrepreneurial mindset and create entrepreneurial intention stimulating entrepreneurial behaviour (Kuratko & Morris 2018; Kautonen, van Gelderen & Fink 2015; Rauch & Hulsink 2015; Walter, Parboteeah & Walter 2013; Neck & Greene 2011). With increasing emphasis on entrepreneurship to support growth (Audretsch et al. 2012), entrepreneurship education is recognised as a key driver (Thrane et al. 2016; Katz 2003). This first lineage has developed over time with substantial research (Mason et al. 2020). However, entrepreneurship education

alone does not provide students the full potential towards entrepreneurial outputs such as entrepreneurial knowledge and skills (O'Brien et al. 2019).

Second, an entrepreneurial ecosystem plays the role of supporting the creation, growth and survival of new ventures (Stam & Spigel 2016). An ecosystem is commonly understood as a community of living organisms and non-living components of a respective environment interacting as a system, which is its biological interpretation (Isenberg 2016). Such an entrepreneurial ecosystem within higher education supports student entrepreneurs to start-up, scaleup, survive and succeed (Rice, Fettes & Greene 2014). This second lineage of the entrepreneurial ecosystem being the support system that aids start-ups and accelerates start-ups among students is an emergent research field (Mason et al. 2020). Given the functions of HEEEs set out above by Rice, Fettes and Greene (2014), entrepreneurship education and entrepreneurial support are equally important to represent the whole HEEE. This intersection of entrepreneurship education and entrepreneurial support enact the crucial role HEEEs play in transforming the mindsets, intentions, capabilities and actions of students.

2.3.6 Sub-ecosystems of HEEEs

According to Fettes, Greene and Rice (2010), Babson's entrepreneurial ecosystem had two significant vectors: (1) an entrepreneurial mindset that involved creating career change among individuals; and (2) entrepreneurial thinking and action in established corporations. This understanding later translated into the initial conceptualisation of HEEEs that recognised 'entrepreneurship education' and 'entrepreneurial support' as the two primary functions (Rice, Fettes & Greene 2014). Since then, there has been research on HEEEs as ecosystems and related to functions of HEEEs.

Entrepreneurship education ecosystems on one hand are a central component of the HEEE, including activities associated to curriculum, co-curriculum and research (Brush 2014). On the other hand, is the provision of entrepreneurial support involving networks, incubators and accelerators within higher education (Guerrero, Urbano & Gajón 2017; Theodoraki, Messeghem & Rice 2018). These entrepreneurship support organisations are crucial components in successful entrepreneurial ecosystems (Spigel 2016). According to literature, these are sub-ecosystems of HEEEs (refer Figure 2.5). Table 2.4 identifies empirical studies with a focus on entrepreneurship education or entrepreneurial support. Within the scholarly work, there seems to be more research related to HEEEs including 'entrepreneurship education' or 'entrepreneurial support' rather than on HEEEs as whole ecosystems.

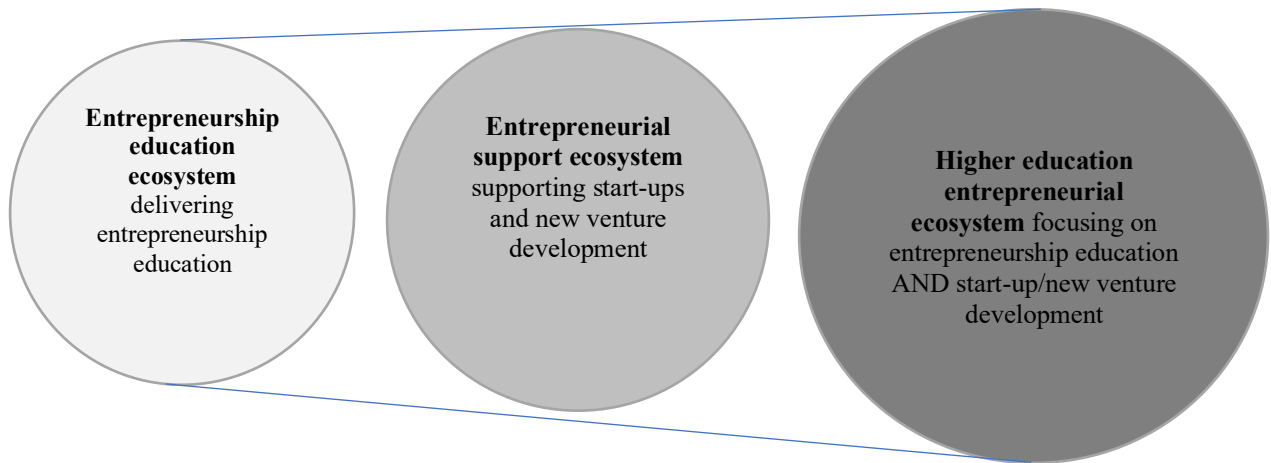


Figure 2.5 – Sub-ecosystems of HEEEs

Table 2.4 – Scholarly work related to HEEEs (by year)

Scholars	Focus	Theory	Methodology	Context	Factors
Lu et al. (2022)	Entrepreneurship education	n/a	Mixed Interviews, Focus groups, Surveys and Documents	China	Incubation platforms, teacher team building, talent training model, organisational structure and curriculum systems
Liu, Kulturel-Konak & Konak (2021)	Entrepreneurship education	Ecosystem theory	Qualitative Interviews	United States	Entrepreneurship curriculum, entrepreneurial activities and practices, organizational structure, resources, leadership vision, core faculty, and operating mechanism
Bock et al. (2020)	Entrepreneurship education	Student Involvement Theory	Quantitative Surveys questionnaire	Germany	Functional experiences and connecting experiences
Mukesh & Pillai (2020)	Entrepreneurship education	n/a	Quantitative Surveys questionnaire	India	Entrepreneurship promotion activity by HEIs, HEIs attitude towards entrepreneurship, department philosophy on entrepreneurship, HEIs teachers and staff, HEIs support for entrepreneurship, HEIs physical infrastructure and facilities, HEIs financial support for entrepreneurship, governance structure, degree of entrepreneurial education in curriculum, student orientation on entrepreneurship, entrepreneurial teaching methodologies, HEIs ability to connect start-up's with industry, mentoring and coaching programs for entrepreneurs, and extracurricular activity relating to entrepreneurship
Middleton et al. (2019)	Entrepreneurship education	Learning theories	Qualitative Interviews	Spain, Sweden, and the UK	Socialised learning, the role of mentorship, and relevance of previous entrepreneurship education
Lahikainen et al. (2019)	Entrepreneurial support	Institutional theory	Qualitative Interviews	Finland	Cognitive: Incubator, entrepreneurial teams, students, university support Normative: roles, values, ways of working and work norms Regulative: Incentives, patents, resources and support services
Bischoff (2018)	Entrepreneurship education	Stakeholder theory	Qualitative Interviews	19 different European countries	Stakeholder involvement and collaboration
Theodoraki, Messegem & Rice (2018)	Entrepreneurial support	Social capital theory	Qualitative Interviews	France	Members, ties, networks, specialisation, diversity, leadership, new entrants, barriers, co-evolution, scalability, culture, shared tools/methods/practices, shared vision, common beliefs, stories, legends, climate, trust, rules, standards/customs/traditions, cooperation, complementarity, reorientation, proximity, and roles/functions/services
Guerrero, Urbano & Gajón (2017)	Entrepreneurial support	Theory of planned behaviour	Secondary databases	Mexico	Incubation mechanism: Entrepreneurial university's services – workshops/networking, contact platforms/points, mentoring and coaching programs, seed financial support Entrepreneurial university's resources: financial, physical and human

2.4 Continuum of HEEEs

The evolution of HEEEs cater for all students, from potential entrepreneurs with an entrepreneurial intention to those simply keen to know about entrepreneurship. However, the static perspective of an HEEE highlighting student start-ups dominates the current literature with studies by several scholars (Longva 2021; Miller & Acs 2017; Rice, Fetters & Greene 2014; Wright, Siegel & Mustar 2017). Student start-ups are only one aspect of the start-up process according to Duruflé, Hellmann and Wilson (2018). The start-up process for students is identified in three stages: (1) creating entrepreneurial mindset and intentions; (2) developing entrepreneurial knowledge and skills; and (3) building start-ups (Duruflé, Hellmann and Wilson 2018).

Given that HEEEs facilitate the start-up process through entrepreneurship education and entrepreneurial support, current HEEEs studies and models were mapped to this process (refer Figure 2.6). First, HEEE scholarly work has predominantly focused on producing student start-ups and fostering students' entrepreneurial mindset and intentions in recent times. There is no evidence of studies investigating the HEEE influence on students' entrepreneurial development; that is, students' entrepreneurial knowledge and skills. Therefore, student entrepreneurial development is identified as a missing link in HEEE literature. Second, the development of HEEEs is a bottom-up movement where HEEEs have emphasised building student start-ups before considering the antecedents that lead to the end of the start-up process.

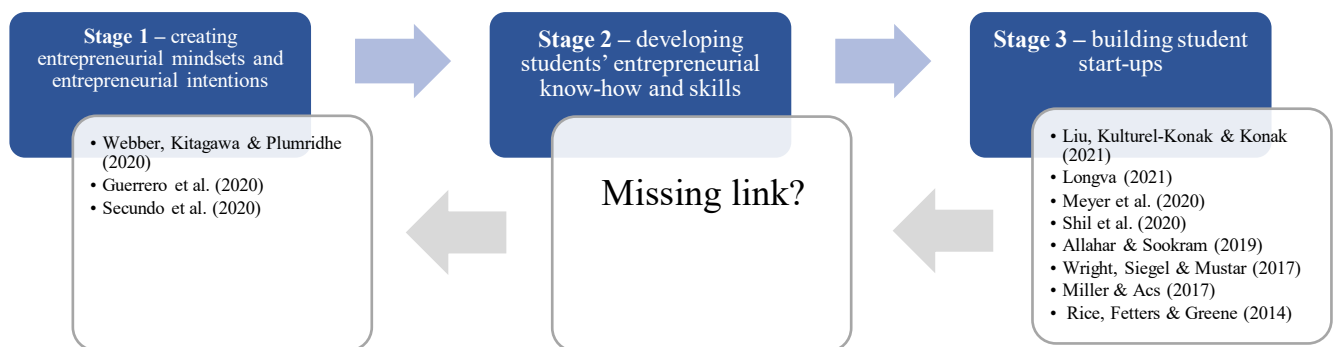


Figure 2.6 – Missing link in HEEE studies through the lens of start-ups process

Adapted from Duruflé, Hellmann and Wilson (2018)

2.4.1 HEEEs for student start-ups

Entrepreneurial ecosystems are linked to the increasing rates of start-ups (Audretsch et al. 2017). Scholars such as Johnson, Bock and George (2019) argue that the development of HEEEs seems to be triggered by student start-ups. Considering the trajectory of HEEEs, higher education institutions promote student entrepreneurship through fostering their ecosystems. HEEEs have had their undivided focus on student start-ups since inception and until recent work by Longva (2021). More scholars have investigated HEEEs in different contexts including the US, Caribbean, India, Bangladesh, South Korea and Norway with a focus on student start-ups over the last decade (Allahar & Sookram 2019; Meyer et al. 2020; Miller & Acs 2017; Shil et al. 2020; Wright, Siegel & Mustar 2017). This is the first wave of HEEE focusing primarily on student start-ups (refer Table 2.5).

Table 2.5 – HEEEs focusing on student start-ups (by year)

Scholars	Theory	Methodology	Context	Focus
Liu, Kulturel-Konak & Konak (2021)	Ecosystem theory	Qualitative In-depth interviews	US	Student start-ups
Longva (2021)	Social network theory	Qualitative In-depth interviews	Norway	Student start-ups
Meyer et al. (2020)	Stakeholders	Quantitative research Survey	US, South Korea and India	Student start-ups
Shil et al. (2020)	Triple helix	Qualitative research Focus group discussions	Bangladesh	Student start-ups
Allahar & Sookram (2019)	Triple helix	Qualitative Case studies Secondary data	Caribbean	Student start-ups
Wright, Siegel & Mustar (2017)	n/a	n/a	Multiple countries	Student start-ups
Miller & Acs (2017)	Turner's frontier thesis	Case study Interviews Observation Documents and media content	US	Student start-ups
Rice, Fetters & Greene (2014)	Resource-based view	Case study Interviews Secondary data (surveys, project data)	US	Student start-ups

2.4.2 HEEEs for students' entrepreneurial psychology

After a decade since the inception of HEEEs, the dominant focus is observed to have expanded from student start-ups to students' entrepreneurial psychology as the second wave (refer

Table 2.6). Although, scholars such as Secundo et al. (2020), Guerrero, Urbano and Gajón (2020) and Webber, Kitagawa and Plumridge (2020) began emphasising students' entrepreneurial mindset and intention through HEEEs recently, the initial conceptualisation of HEEEs underlined entrepreneurial mindset and intention. The main vector of Babson's entrepreneurial ecosystem concentrated on entrepreneurial mindset to create and embrace change and foster a passion for identifying opportunity leading to entrepreneurial intention (Fetters, Greene & Rice 2010). Though students' entrepreneurial psychology was embedded in the early work of HEEEs based on Babson's entrepreneurial ecosystem model, scholars seem to have paid a majority of their intention to student start-ups (Johnson, Bock & George 2019). These studies on students' entrepreneurial mindset and intention within HEEEs were based in the UK, Mexico and Italy (Guerrero, Urbano & Gajón 2020; Secundo et al. 2020; Webber, Kitagawa & Plumridge 2020).

Table 2.6 – HEEEs focusing on students' psychology (by year)

Scholars	Theory	Methodology	Context	Factors	Focus
Webber, Kitagawa & Plumridge (2020)	Theory of planned behaviour	Mixed research Online survey Public databases Institutional documentation	UK	Entrepreneurship education, extracurricular activities (volunteering in enterprise activities and enterprise activities in the private sector) and enterprise experiences (short/intensive programs on entrepreneurship and enterprise skills, enterprise advice sessions)	Students' entrepreneurial intention
Guerrero et al. (2020)	Utility-maximising function	Quantitative research Survey	Mexico	Educational programs and incubators	Students' entrepreneurial intention
Secundo et al. (2020)	Quadruple helix	Case study Observations, documents, interviews and survey	Italy	Intentional flows of knowledge: Seminars, case studies, workshops, business idea competition and entrepreneurs in residence. Unintentional flows of knowledge: Business plan stimulation, students aboard, prototype development, business model canvas design, enterprise project and open innovation challenge	Students' mindset

2.4.3 HEEEs for student entrepreneurial development

Higher education for entrepreneurship focuses on personal development, knowledge, mindset, skills and abilities, or setting up a venture and becoming self-employed (QAA 2012). Lackéus (2015) suggests two distinct views for higher education institutions: a narrow view and wide view. As per the narrow view of entrepreneurship, higher education institutions put emphasis on students becoming entrepreneurs through opportunity identification, business development and self-employment (Lackéus 2015; Fayolle & Gailly 2008). Through the wide view of entrepreneurship, higher education institutions give importance to students becoming entrepreneurial via self-development (Lackéus 2015). The view and approach used profoundly affects the outcomes from higher education institutions. Considering the extant literature of HEEE studies such as Longva (2021), Meyer et al. (2020), Shil et al. (2020), Allahar and Sookram (2019), Wright, Siegel and Mustar (2017), Miller and Acs (2017) and Rice, Fetters and Greene (2014), the prominence is on the narrow view of entrepreneurship where higher education institutions strive for student start-ups where the student undertakes the career option of an entrepreneur. Therefore, the primary focus of entrepreneurship scholars has been on students founding a new venture and there is no doubt that this is an important outcome and fruitful area of research (Burton et al. 2016). However, it is worthwhile to consider whether there should be focus on the transition to entrepreneurship including the entrepreneurial development of the students. Students' entrepreneurial development includes mindset, intention and capabilities.

When co-creating HEEEs, higher education institutions can promote entrepreneurship in unlimited ways (Wright, Siegel & Mustar 2017; Morris & Kuratko 2014). One way is higher education institutions promoting student start-ups as a key part of their third mission role (Mason et al. 2020). Another is by fostering entrepreneurial mindset and intention (Webber, Kitagawa & Plumridge 2020). However, HEEEs have the potential not only to produce student start-ups and encourage entrepreneurial intention but also to develop the skill set of undergraduate students driving successful entrepreneurial activities (Chávez-Tellería et al. 2017). Extant literature emphasises the student entrepreneurial behaviour and student start-ups, but little attention has been paid to students' entrepreneurial development. One of the challenges that higher education institutions face is to encourage, support and facilitate student development and, by focusing on student development, the gains could be transformational and widespread (Birch et al. 2017). Scholars such as Maritz et al. (2020) argue that higher education institutions are not exploring the full potential of entrepreneurship education for student

development. Therefore, greater understanding of the influence of HEEEs on student development is imperative to produce potential student entrepreneurs with entrepreneurial capabilities (Middleton et al. 2019).

Should higher education institutions focus on improving the transitions to entrepreneurship better within their HEEE? In other words, smoothen the transition from entrepreneurial mindset and intentions to entrepreneurial knowledge and skills and to student start-ups? When relating to the work by Duruflé, Hellmann and Wilson (2018) on student start-ups, it seems that higher education institutions tend to develop HEEEs through bottom-up initiatives; several HEEEs studied in works by Allahar and Sookram (2019); Liu, Kulturel-Konak and Konak (2021); Longva (2021); Meyer et al. (2020); Miller and Acs (2017); Rice, Feters and Greene (2014); Shil et al. (2020) and Wright, Siegel and Mustar (2017) are centred on Stage 3 student 'start-ups'. The trend of HEEEs focusing on student start-ups may have been taken on as higher education institutions are strongly associated with economic development and social progress (Mascarenhas et al. 2017). This is natural as higher education institutions in increasing global competition are striving to contribute to economic growth and social development through knowledge transfer and research commercialisation (Wright 2014). More recently, there is an emphasis in HEEE studies on Stage 1 'entrepreneurial mindsets and intentions' through the work of Guerrero, Liñán and Cáceres-Carrasco (2020), Secundo et al. (2020) and Webber, Kitagawa and Plumridge (2020). With reference to the student start-up process, there is limited literature that shows HEEEs have not yet captured Stage 2, which involves students' entrepreneurial development through knowledge and skills (meaning capabilities). Embedding students in HEEEs is an emerging practice (Siegel & Wright 2015; Wright, Siegel & Mustar 2017), with limited empirical investigations in the same research space (Middleton et al. 2019).

Developing students for entrepreneurship relates to behavioural changes of the individual as well as the outcome of the behaviour (Mitchelmore & Rowley 2010). Student entrepreneurial development in terms of knowledge, skills and attitude are understood as capabilities that is essential to initiate and engage in entrepreneurial activity (Bacigalupo et al. 2016). Entrepreneurial activity may occur later in a former student's career, so building the capability in them increases the understanding and the possibility of finding success in these efforts. Alternatively, it is not just about start-ups but also about being entrepreneurial in existing organisations – intrapreneurs leading change, finding new ways to reach customers, innovating on products and services (Alsos et al. 2022). Limited studies focus on the broader

context of student entrepreneurial development including capabilities associated with HEEEs. The need to address this knowledge gap in understanding HEEEs for students' entrepreneurial development represents the missing link.

Student development is understood as the ways in which a student grows, increasing their capabilities as a result of their higher education experience (Rodgers 1990). Theories of student development take into account the nature of learning, including the different contexts in which learning and development occurs, leading to the well-rounded development of a student (Walker 2008). There is a debate on how development is received differently by male and female students (Belenky 1997; Magolda 1992), however this study does not delve into the gendered differences. In the pursuit of student development, the challenge is not to overwhelm students and to pair activities with appropriate support (Felder 2004).

In terms of context, strong entrepreneurial ecosystems are found in countries such as the US (Bauman & Lucy 2021; Regele & Neck 2012). Different to developed countries, co-creating HEEEs in a resource-constrained environment is a critical challenge (Bedő, Erdős & Pittaway 2020). Benchmarking HEEE factors found in the successful HEEEs of such countries is likely to raise contradictions in resource-scarce environments (Bedő, Erdős & Pittaway 2020). One of the first studies that specifically identified HEEEs in resource-constrained environments was by Bedő, Erdős and Pittaway (2020). Based on the literature, their study suggested a conceptual framework for student start-ups using Stam's (2015) entrepreneurial ecosystem. However, little is known about how higher education institutions can co-create HEEEs in resource-scarce environments. There is limited empirical evidence about how an HEEE can facilitate student entrepreneurial development in a resource-constrained environment.

2.5 Composition of HEEEs

The composition of HEEEs refers to their key ingredients. According to extant literature, there are a few empirical studies on HEEE models that make important contributions addressing the composition of HEEEs. To provide insight into the chosen topic of HEEEs and the wider view of literature, the following is organised into two sections: factors of HEEEs and actors of HEEEs.

2.5.1 Factors of higher education entrepreneurial ecosystems

Given the notion of HEEEs, ‘factors’ are a key element of their composition. Studies suggest that there is no definite set of factors that enable higher education institutions to support students’ entrepreneurial activity (Algieri, Aquino & Succurro 2013; Rice, Feters & Greene 2014). Among extant literature, there are individual-level factors, institutional-level factors and context-related factors. Previous studies have investigated students’ prior entrepreneurial experience (Webber, Kitagawa & Plumridge 2020) and parental influences (Bock et al. 2020; Webber, Kitagawa & Plumridge 2020) as individual factors, which were found to positively influence students in HEEEs. Individual-level factors are critical, including students’ attitudes towards entrepreneurship, and these factors are influenced by contextual factors such as entrepreneurship education, role models and reward systems (Guerrero & Urbano 2012). Such contextual factors refer particularly to environment-specific factors, noted as significant in shaping entrepreneurial activities in HEEEs by Webber, Kitagawa and Plumridge (2020), and in contrast to studies focusing on individual and institutional factors. As HEEEs are evolving, there is a need to understand the contextual factors that characterise HEEEs and the role that these factors play for theoretical development (Longva 2021; Wright, Siegel & Mustar 2017).

One of the earliest references to HEEEs is found in the scholarly work by Feters, Greene and Rice (2010) that discusses pathways to developing HEEEs with wide-ranging missions and resources in different contexts. The same study extended into a series of case studies of six higher education institutions in North America, Latin America, Europe and Asia that led to seven key success factors supporting entrepreneurship development through entrepreneurship education and entrepreneurial support (Rice, Feters & Greene 2014). These seven factors are (1) senior leadership vision, engagement and sponsorship; (2) strong programmatic and faculty leadership; (3) sustained commitment over a long period; (4) commitment of substantial financial resources; (5) commitment to continuing innovation in curriculum and programs; (6) an appropriate organisational infrastructure; and (7) commitment to building the extended enterprise and achieving critical mass. Since this work, an increasing number of studies have examined higher education institutions and categorised the factors that form a comprehensive and highly evolved HEEE, with contextual relevance (Stam & Spiegel 2016).

Despite growing scholarly work, the literature overlooks understanding and knowledge for those who seek to promote entrepreneurship in resource-constrained environments (Roundy 2017). Resource-constrained environments may lack factors and interactions between these

that are inevitable yet important in ecosystems (Borissenko & Boschma 2017). In contrast to developed countries, co-creating HEEEs in a resource-constrained environment is inherently challenging (Bedó, Erdős & Pittaway 2020). However, countries with resource constraints are no different to other developed countries as developing countries can give a high priority to entrepreneurship but may lack the resources for it (Roundy 2017). Despite the relevance of students' knowledge, skills and attitudes to pursue entrepreneurship, not enough empirical studies have explored the role of contextual factors on student entrepreneurial development in a resource-constrained environment.

Whether entrepreneurship can be taught in a classroom is a common question (Neck & Greene 2011; Henry et al. 2004). However, scholars argue that entrepreneurship should be regarded as any other discipline that can be taught and learned (Neck & Greene 2011; Sarasvathy 2004; Holmgren & From 2005; Drucker 1985). Collins et al. (2004) reveal that higher education institutions do not provide students the entrepreneurial context or environment to groom and develop their entrepreneurial ideas. Mayhew et al. (2017) argued whether higher education institutions can influence student development, specifically innovative capacities, through experiences during higher education. In response, Bock et al. (2020) found that functional experiences (such as resources and physical spaces) and connecting experiences (such as experimental studies, field trials, design projects or internships) have a significant impact on students' innovation capabilities. However, this recent study is more focused on entrepreneurship education exploring student development through a brief list of four aggregated factors. Further, informal factors (such as role models) have a greater influence on students compared to formal factors (such as education and training and support measures) (Guerrero, Urbano & Fayolle 2016).

The empirical study by Bock et al. (2020) found two HEEE factors that are responsible for improving students' innovation capacities at an aggregated level. Scholarly work is criticised for suggesting factors rather than providing explanations of mechanisms on how they work (Longva 2021). This calls for attention to the breakdown of broad HEEE factors investigated as combinations and further exploration on 'how' and 'why' factors work in resource-constrained environments. Formal and informal mechanisms between higher education institutions and stakeholders from wider entrepreneurial ecosystems facilitate teamwork and access to resources (Etzkowitz & Klofsten 2005). These mechanisms of higher education institutions engaged in the third mission can include collaborating with the local environment and anchoring to organisations building a network to exchange tacit knowledge

(Bramwell & Wolfe 2008). A holistic ecosystem model that offers support mechanisms along with relevant stakeholders for students leads to access of varied resources and broader social networks (Fuster et al. 2018).

In addition to empirical research, scholars have contributed to HEEE literature by synthesising extant literature as reviews. There are two systematic reviews and one integrative review related to HEEEs from recent years, by O'Brien, Cooney and Blenker (2019), Hayter et al. (2018) and Belitski (2017). In these previous reviews, scholars have concluded with:

- six considerations for expanding university entrepreneurial ecosystems for under-represented communities (O'Brien, Cooney & Blenker 2019)
- eight independent factors and three dependent outcomes beyond the individual level (Hayter et al. 2018)
- four university-based entrepreneurship ecosystem enablers for knowledge commercialisation and engagement (Belitski 2017).

While these reviews focused on the factors of HEEEs, such as teaching and learning, outreach, culture, resources, stakeholders, networks and infrastructure (O'Brien, Cooney & Blenker 2019; Hayter et al. 2018; Belitski 2017), perhaps they have not fully contributed to HEEE composition.

2.5.2 Actors of higher education entrepreneurial ecosystems

Like any biological ecosystem, an HEEE is a multi-stakeholder environment including a complex network of individuals, groups and organisations that support entrepreneurship education and the creation of start-ups and growth of ventures (Fetters, Greene & Rice 2010; Rice, Fetters & Greene 2014). Stakeholders are the human and social actors of ecosystems that create engagement and dynamism in an environment (Johnson et al. 2019). The successful collaboration of diverse stakeholders attracts a combination of perspectives, experiences, competencies and mindsets that contribute to E&I within the ecosystem (Secundo et al. 2020). Higher education institutions creating shared value with stakeholders have been studied previously in other disciplines but not extensively within an entrepreneurial ecosystem setting for higher education (Karwowska 2019; Bischoff et al. 2018). Extant literature shows a paucity of entrepreneurship education studies that have focused on stakeholders and applied stakeholder or network theories (Galvão et al. 2020). Even fewer studies have explored the interplay of stakeholders in relation to factors and the need to explore how stakeholders can support and collaborate within HEEEs (Longva 2021).

As every HEEE is distinct, each ecosystem consists of a set of actors and factors unique to the higher education institution. Studies by Fetters, Greene and Rice (2010) and Rice, Fetters and Greene (2014) identify a combination of internal and external stakeholders evident among HEEEs of developed economies. Miller and Acs (2017) identify these internal actors as faculty/adjuncts, students, alumni, mentors and external stakeholders as corporations, angel investors / venture capitalists, start-up founders, government and incubators/accelerators. In a recent study, actors of a respective HEEE were classified in four role based domains as Leaders and Governors, Educators, Innovators and Connectors (Chaipongpati, Thawesaengskulthai and Koiwanit 2022). For a broader understanding of stakeholders in the entrepreneurial ecosystem, Isenberg’s (2010) domains of the entrepreneurship ecosystem is a suitable framework (refer Figure 2.7). Outside the higher education institution and their HEEE are stakeholders representing the different domains – supports, culture, finance, policy and markets.

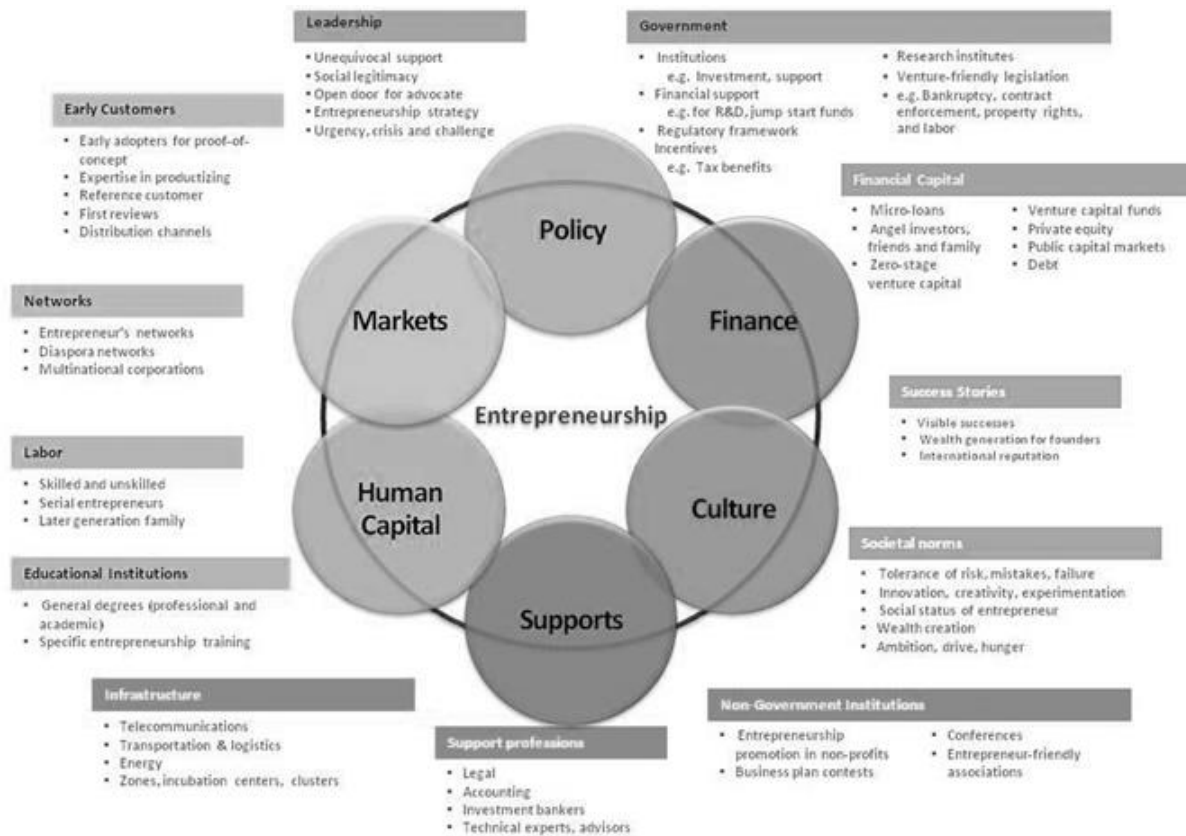


Figure 2.7 – Domains of the entrepreneurial ecosystem

Source – Isenberg (2010)

Stakeholder support and collaboration contributes to a strong sustainable entrepreneurial ecosystem (Bischoff 2019). Extant literature emphasises how engaging with

various external actors shapes the development of HEEEs and the significance of managing these external actors to increase entrepreneurial activity (Link & Sarala 2019; Alvedalen & Boschma 2017). For instance, Babson College (in the US) receives external funding for its ecosystem operations, secured from various sources (Hancock 2011). Entrepreneurs and corporates are the most common external stakeholders engaged in sharing the practical essence of entrepreneurship and complementing academic view (Bischoff et al. 2018). However, the role of stakeholders evolves as the ecosystem develops (Colombelli et al. 2019).

2.6 Stakeholders in HEEEs

2.6.1 Relationship building with ecosystem stakeholders

When advancing from the traditional functions of teaching and researching into the role of innovation, higher education institutions took on the triple helix of university–industry–government relations (Etzkowitz & Leydesdorff 2020). A higher education institution becomes a relationship builder that creates a configuration of stakeholders through relationships and these relationships are likely to change throughout the university life cycle (Redford & Fayolle 2014). Different stakeholders within the institution such as management, faculty, students and external stakeholders at local, regional and national levels share synergies in the ecosystem. External stakeholders have grown from industry and government to include more from the entrepreneurial ecosystem. These relationships are networks of various stakeholders from the institution and their external domain (Beliski & Heron 2016). While stable relationships can be critical in the flow of entrepreneurship education (Bischoff et al. 2018), creating a balance in synergies between these stakeholders is complex (Leydesdorff 2000).

Levels of stakeholder involvement and interaction vary from high to low among higher education institutions and stakeholder groups (Bischoff et al. 2018). Perceptions and interests held by stakeholders influence their involvement and contribution to the process of entrepreneurship in higher education (Matlay 2009). Therefore, the involvement of stakeholders must be mutually beneficial and self-sustaining, where they work together with shared efforts in stimulating entrepreneurial activity (Wadee & Padayachee 2017). Such involvement can be geographically constrained, creating a boundary and making it difficult for stakeholders to effectively engage (Acs et al. 2014).

Higher education institutions that go beyond start-ups require stakeholder engagement in different entrepreneurial initiatives (Clauss, Moussa & Kesting 2018). This also calls for recognising that engaging stakeholders is more important than establishing entrepreneurial

support for new venture creation (Gibb & Hannon 2006). Students intending to become entrepreneurs or alumni creating a start-up value practical knowledge and are influenced by stakeholders in the external environment (Hayter et al. 2017). The interactions and interconnectedness among various stakeholders may result in a truly entrepreneurial learning experience for students and highlights the dynamic nature of entrepreneurial activity within the ecosystem (Wright, Siegel & Mustar 2017). Entrepreneurs are one of the key stakeholders in HEEEs and are recognised for support in identifying opportunity, offering confidence about the business idea and creating a start-up (Spigel & Harrison 2017). Alumni who become entrepreneurs are known to serve higher education institutions as mentors, investors or donors, and they are also involved in teaching as visiting faculty (Powell & Walsh 2018). This draws on the importance of identifying relevant stakeholders within the HEEE, including external stakeholders from the wider entrepreneurial ecosystem (Wright, Siegel & Mustar 2017).

2.6.2 Stakeholder engagement in HEEEs

Stakeholders can interconnect and interact by collaborating in various factors of an HEEE to promote entrepreneurship. Despite stakeholder management not being a new concept, understanding the variety of stakeholders, their roles, and possibilities for collaboration is critical in developing a well-connected and effective HEEE (Brush 2014). When managing stakeholder engagement in HEEEs, higher education institutions need to be mindful that it is a progressive process that can be planned and phased (Redford & Fayolle 2014). By embedding key stakeholders into the HEEE and engaging them effectively, higher education institutions can promote entrepreneurial activity within their HEEE and contribute to their region and country. HEEE is a collective action and coordinated collaboration between higher education institutions and other stakeholders (Wright, Siegel & Mustar 2017). Similar to entrepreneurship education literature (Bischoff et al. 2018), stakeholder engagement has received less attention in the context of HEEEs.

Higher education institutions and other stakeholders need to invest in promoting entrepreneurship (Prencipe et al. 2020), as well as enhancing the development of HEEEs that nurture the entrepreneurial potential of students (Guerrero et al. 2014). When deciding on various stakeholders, it is significant to determine the importance and prospective contribution of each stakeholder (Redford & Fayolle 2014). Even though literature showcases stakeholders with different interests involved in facilitating entrepreneurship (Galvão et al. 2020), stakeholders keen on collaborating with students and with the higher education institution are a distinct group. Existence and interrelationships of heterogenous stakeholders who share the

same goals are essential, as they provide or become non-academic contacts that might not exist otherwise (Hayter 2016).

The core of an entrepreneurial ecosystem is formed by its stakeholders and is characterised by the interactions between their entrepreneurial aspirations, attitudes and abilities (Ács, Autio & Szerb 2014). An entrepreneurial ecosystem takes the form of a dynamic structure that is social and evolves through social networks (Spigel 2017). Entrepreneurs with strong social networks are in a more favourable position to acquire resources than entrepreneurs who are not active in their entrepreneurial ecosystem (Spigel & Harrison 2018). The social element involves resources and these are acquired through social networks. The flow of resources takes place through formal and informal social networks and is significant for the development and emergence of entrepreneurial ecosystems (Cohen 2006). Emerging ecosystems are characterised by sparse social networks. In their growth phase, ecosystems have developed social networks and successful ecosystems are resource rich with dense social networks (Mack & Mayer 2016; Spigel & Harrison 2018).

In a successful ecosystem, relationships can be internal to internal (faculty and student), external to internal (entrepreneur and student) and external to external (alumni to investor) (Powell & Walsh 2018). The dynamics of the environment affect the ecosystem and their outcomes; however, the involvement of stakeholders significantly impacts each stakeholder and the factors of the ecosystem (Godley et al. 2019). Formal and informal connections between ecosystem stakeholders in social networks can contribute to the development of HEEEs and enhance their access to resources. HEEEs are formed with different stakeholders, including the internal community of faculty, staff, students and alumni, and the local community, each with different priorities (Huang-Saad, Duval-Couetil & Park 2018). Further, attention should be paid to how diverse stakeholders can engage within the factors of HEEEs and influence students' entrepreneurial development in a resource-constrained environment.

2.7 Chapter summary

This chapter analysed literature that showed HEEEs have a lineage from entrepreneurial ecosystems and have been developing since their emergence. While definitions for HEEEs are being posited, the prominence is on 'actors' (i.e. stakeholders) of the ecosystem. When comparing this to a common definition of entrepreneurial ecosystems by Stam (2015), it appears that a more complete definition of the HEEE concept would include 'factors and actors'. Further, academic research on HEEEs has grown in a somewhat fragmented nature,

with studies focusing on entrepreneurship education ecosystems and entrepreneurial support. This research will explore the HEEE concept in terms of its composition (i.e. factors and actors) and their linkage to the wider entrepreneurial ecosystem, taking a holistic approach.

The accumulation of HEEE studies in Table 2.5 and 2.6 presents the key scholars, applied theories, methodology, context investigated and findings. More HEEE studies have examined the composition leading to student start-ups and recent HEEEs are working towards student entrepreneurial intention and mindset. With entrepreneurship education and entrepreneurial support included, HEEEs can contribute to students' entrepreneurial development. There is scholarly work on student entrepreneurial development in entrepreneurship education ecosystems through the work by Bock et al. (2020) focused on innovation capabilities. However, there is limited scholarly work found investigating the HEEE factors that could lead to students' entrepreneurial development. Thus, this study investigates HEEEs focused on students' entrepreneurial development, in particular E&I capabilities that emerge from the data.

CHAPTER 3: CONTEXTUALISATION – SRI LANKA

3.1 Chapter overview

During a study, contextualising may occur in the research problem, design, methodology, site, analysis or interpretation (Rousseau & Fried 2001). Contextualisation is central to entrepreneurship research (Welter 2011), with the understanding that ecosystems are unique in the geographic location they are embedded in (Acs et al. 2014). Under this direction, the following chapter focuses on the geographic context for this research (refer Figure 3.1).

According to Walmsley (2018), this is the ‘Asian Century’, with the prediction of Asian countries to rise. Sri Lanka is one such emerging South Asian country optimistic about harnessing entrepreneurship among its youth through quality education (Ministry of Sustainable Development 2018). The chapter begins with an overview of the socio-economic conditions of Sri Lanka. The bulk of the chapter frames Sri Lanka as a resource-constrained environment through the importance of quality education and entrepreneurship for youth, the country’s progress in sustainable development, and challenges faced by the higher education sector. The chapter closes with an overview of entrepreneurship education, entrepreneurial ecosystems, start-up entrepreneurs and what drives them in Sri Lanka. As a country, Sri Lanka does not actively engage and invest in research (de Silva, Uyarra & Oakey 2012) and this chapter is written with the latest available information from public and open sources.

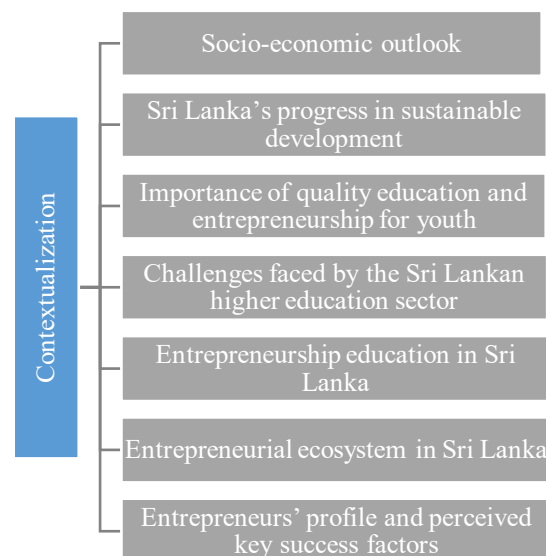


Figure 3.1 – Chapter 3 outline

3.2 Macro-environment outlook of Sri Lanka

Context including conditions and circumstances are not only relevant to a study but contextualising the study also contributes to a deeper level of meaning (Maritz & Brown 2013). Context is significant in this study where there is no ideal HEEE to benchmark entrepreneurship education and entrepreneurial support. In this case, differences in socio-economic conditions and circumstances of countries matter as they influence how entrepreneurs start and run a new venture (Karlsson et al. 2019; Welter et al. 2017). Below is an overview of how Sri Lanka is positioned in terms of history and development, people, culture and communication, economic growth, school education system and the higher education system.

3.2.1 History and development

Sri Lanka is an island nation of 64,630 km² of land located in the Indian Ocean with a geo-strategic position (United Nations 2021). Sri Lanka plays a crucial role in the Indian Ocean region and has become important to countries like the US, China, India and Japan due to its naval link between West Asia and South-East Asia. A Dutch, then British, colony and originally named Ceylon, the nation despite its small size has a rich biodiversity with a range of ecosystems ranging from rainforests to grasslands, rivers, wetlands and freshwater bodies and coastal and marine ecosystems (United Nations 2021). Gaining independence in 1948, the nation had limited economic growth as development and industrialisation were limited, Sri Lanka being a colony focused on primary products. A long civil war (1983–2009) further stalled development, and since then the nation has emerged post-war to grow into a developing country. Having successfully achieved the Millennium Development Goals in 2015, Sri Lanka reaffirmed its commitment to the SDGs by aligning national policies and strategies for a country enriched by 2025 (Ministry of Sustainable Development 2018).

3.2.2 People, culture and communication

Known as the pearl of the Indian Ocean, in close proximity to India and Maldives, Sri Lanka is an island home to a population of 23,044,123 people as of July 2021 (refer Figure 3.2) (CIA Online). National censuses show that the people of Sri Lanka belong to four major ethnic communities, being Sinhalese (74.9%), Sri Lankan Tamil (11.2%), Moors (9.2%) and Indian Tamil (4.2%). Sri Lanka is a multi-religious and multicultural country with 70.2% Buddhist, 12.6% Hindu, 9.7% Muslim, 6.1% Roman Catholic and 1.3% Christian (CIA Online). Sri Lankan people primarily speak the national language ‘Sinhala’, and a smaller proportion

communicate in Tamil as the second national language (Sittarage 2018; Parliament Secretariat 2015). English proficiency is 22% among those over 15 years of age and improving as the government strives to build an English-literate Sri Lanka (Institute of Policy Studies of Sri Lanka 2014). English, the link language, is common among the urban population living in Colombo, where 32.9% speak English, and 34.1% can read and write in English (Department of Census and Statistics 2019; Parliament Secretariat 2015).

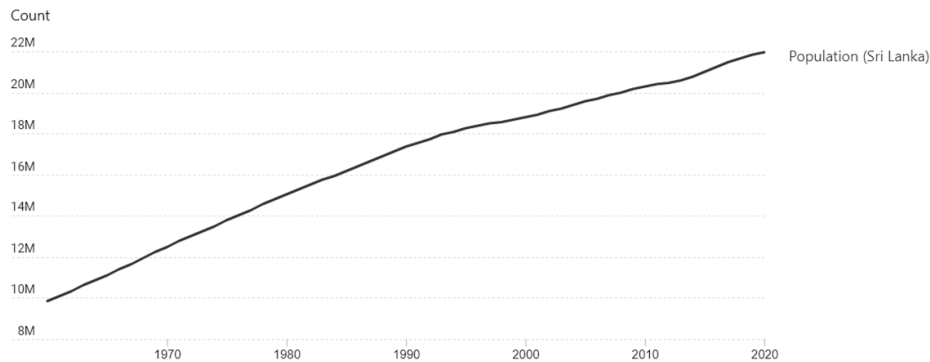


Figure 3.2 – Population in Sri Lanka

Source –World Bank (2020)

3.2.3 *Economic growth*

After the end of a 30-year civil war in 2009, Sri Lanka showed signs of promising economic development, with an average gross domestic product (GDP) growth of 5.8% during 2010–2017 (World Bank 2020). In 2018, Sri Lanka was recognised for climbing to upper-middle income status with a GDP per capita of USD4,102 and earning the highest 57.11 points on the global competitiveness report (World Economic Forum 2018). Sri Lanka’s economy is mainly based on the service and industrial sectors, and agriculture and the services sector contributed to growth by 3.6% in 2017 and 4.7% in 2018 (PricewaterhouseCoopers 2019). The following year, the country fell back to being a lower-middle income country with a GDP per capita of USD3,852 in 2019 (World Bank 2020).

Sri Lanka is experiencing a multidimensional crisis followed by the terrorist attacks, the COVID-19 global pandemic and political and economic crisis (World Bank 2022). The economy continued to show weakening signs even before the COVID-19 pandemic and growth averaged only 3.1% between 2017 and 2019 (World Bank 2021). Concurrent challenges in finance, debt, food, fuel, and medication have disrupted the economy and livelihood in Sri Lanka (United Nations Sri Lanka 2022). The economic outlook for Sri Lanka is highly uncertain due to the fiscal and external imbalances (World Bank 2022).

The economy contracted by 3.6% in 2020 (refer Figure 3.3) due to the impact from the pandemic and as the country struggled to control the spread of the virus in 2021. As such, Sri Lanka is now considered a lower-middle income country with a GDP per capita of USD3,682 as at 2020, having declined from USD4,108 in 2017 (World Bank 2020). Sri Lanka’s GDP is similar to other developing countries in South Asia, including India, Pakistan, Bangladesh and Bhutan (refer Figure 3.4). Within Asia, Sri Lanka is an emerging economy like Cambodia, Indonesia, Myanmar, Philippines and Vietnam (refer Figure 3.5).

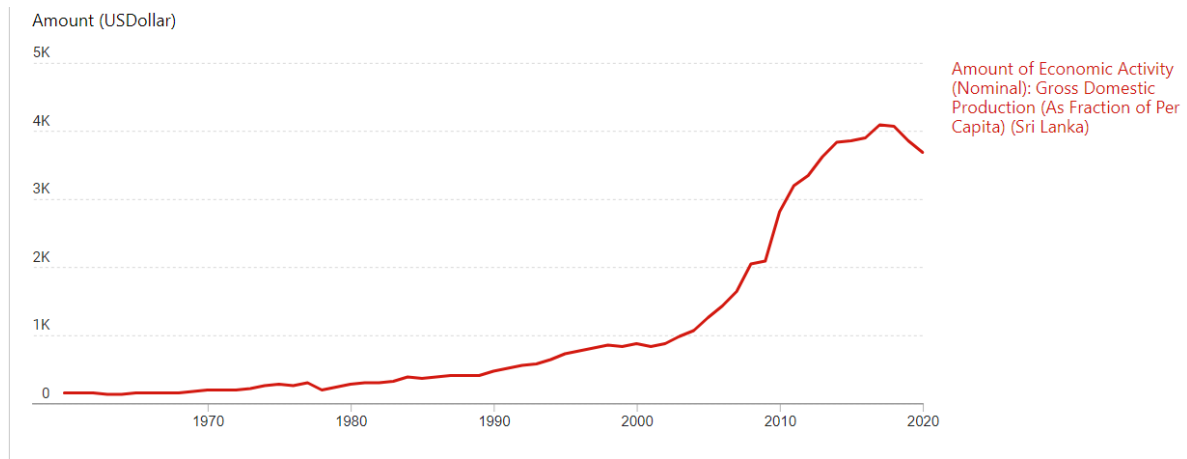


Figure 3.3 – Economic activity (GDP as a fraction of per capita) in Sri Lanka

Source –World Bank (2020)

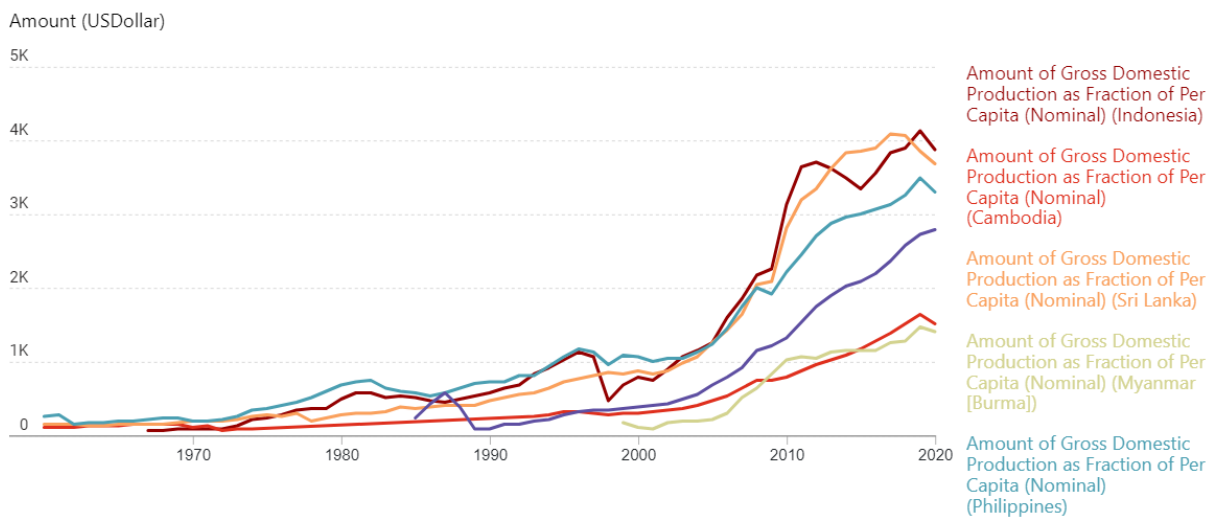


Figure 3.4 – Economic activity comparison of emerging economies in Asia

Source –World Bank (2020)

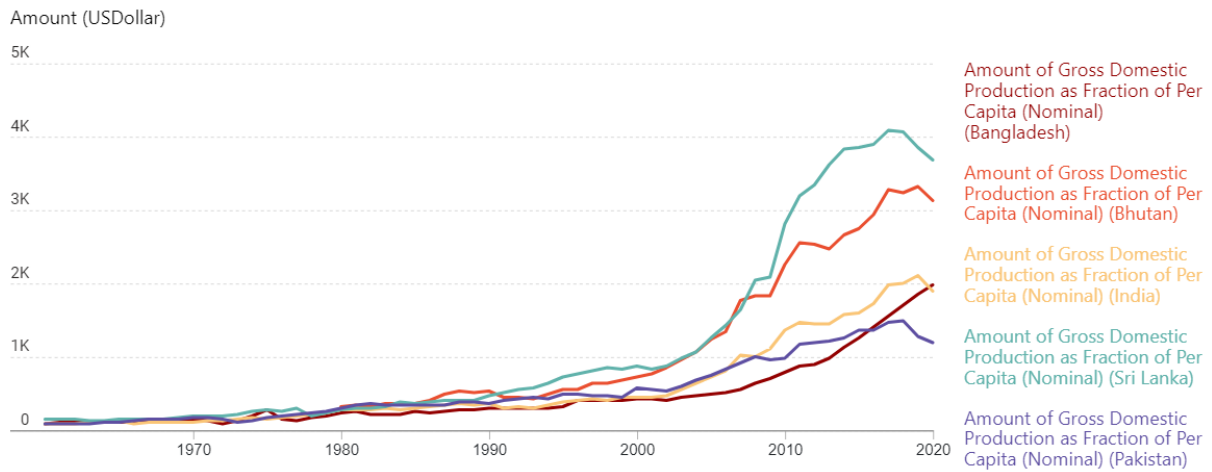


Figure 3.5 – Economic activity comparison of developing countries in South Asia

Source –World Bank (2020)

3.2.4 School education system

Education in Sri Lanka operates on a ‘free education bill’ where every child above five years old until university level is entitled to free education (Ministry of Sustainable Development 2018). After the civil war ended in May 2009, the Sri Lankan government focused on improving education aimed at human development. However, these education reforms are criticised for being political responses in a patronage political environment to contain voters’ political interest (Little 2011). For many years, any Sri Lankan child could drop out of school at 14 years of age without completing secondary education. This choice was amended recently, making students continue school up to the ‘ordinary’ level, earning a secondary education certificate (Ministry of Education 2016).

Over the last decades, the public education system has suffered from a lack of funding, resources, facilities and infrastructure, yet young students have showcased their talents by winning internationally recognised awards and medals (Ministry of Education 2016). In 2018, Sri Lanka was recognised by the United Nations as an over-achiever for successfully developing its primary education sector by satisfying all targets, including literacy rates, school enrolments and education completions (United Nations 2020). This achievement was noted for how Sri Lanka stood tall in South Asia and middle-income and high-income countries. There were 10,175 public schools with 4,214,772 students and 98 private schools with 125,669 students as of 2018. The government-funded public schools mainly supplied the demand for primary and secondary education (Ministry of Education 2016).

3.2.5 Higher education structure and sector

The Universities Grants Commission (2019) is the apex body of the higher education system in Sri Lanka, with the responsibility of facilitating the provision of undergraduate, postgraduate and professional education through an integrated system of state universities and higher education institutions. The state sector (also known as the public sector) comprises 36 entities consisting of 16 universities, 17 institutes and three campuses, offering 225 courses of study funded by the government (Universities Grants Commission 2019). Among these 16 universities, the University of Peradeniya has the longest historical roots, and the University of Sri Jayewardenepura has the largest student population (Weerasinghe & Jayawardane 2018).

In addition to the UCG governed public universities, there are non-UCG governed public universities, degree granting institutions, professional institutions and vocational training centres. Private higher education institutions are established and emerging in support of the government policy (Weerasinghe, Jayawardane & Deshani 2016) and some of these institutions are diversified businesses of local large companies. Almost all higher education institutions including in the public sector predominately focus on teaching and academics focus on a singular role (Weerasinghe, Jayawardane & Deshani 2016; de Silva et al. 2012), while the third mission of research and entrepreneurship are functions still emerging.

Due to the free education policy, there is a high degree of dependence on government resources such as funding (de Silva, Uyerra & Oakey 2012). Public universities receive limited funding due to numerous other priorities such as poverty (de Silva, Uyerra & Oakey 2012). Out of 250,000 students who take the advance-level examinations every year, 150,000 qualified for higher education, 92,379 applied for university admission for the academic year 2019/2020 and public universities can only accept 45,000 students (Sri Lanka Export Development Board 2022). The demand for higher education is beyond the supply public higher education can serve, creating the need for private higher education institutions in support.

The last record of the private higher education sector was 47 degree granting institutions across the country (Gamage & Wijesooriya 2011). These private higher education institutions are concentrated mainly in the Western Province including Colombo with a few located in Kandy of the Central Provinces (The World Bank 2019). These private higher education institutions are companies established under the Company Law of Sri Lanka with local or international ownership and funding (Wickramasinghe 2018). The private higher education institutions offer higher education as a service in affiliation with international universities.

Unlike public sector education, these companies are not fully regulated under the Ministry of Higher Education and University of Grants Commission (Wickramasinghe 2018). For example, India enacted the Establishment of and Maintenance of Standards in Private Universities Act in 2003, allowing the University of Grants Commission to regulate their private higher education sector. This standardisation brought in order, quality and relevance while increasing private higher education supply in India (Gamage 2012). Private higher education institutions in Sri Lanka operate like any other private company, with no local regulation or guidance relating to higher education. Due to their independence, these institutions may benefit from this research to become entrepreneurial, evolve their HEEEs to develop student capabilities in entrepreneurship and innovation, and contribute to the national priority on entrepreneurship.

3.3 Sri Lanka's progress in sustainable development

Sri Lanka is one of the 193 United Nations member states committed to the 2030 agenda on sustainable development. The Sri Lankan government follows an institutional plan themed as 'Vision 2025' and aligned to respective SDGs. The plan is governed by the Sustainable Development Act, enacted in 2017 and a Sustainable Development Council to implement the Act (Ministry of Sustainable Development 2018). A national review in 2018 recognised that Sri Lanka had begun progress towards a sustainable and resilient society (United Nations 2020). The most recent update related to the goal for 'quality education' signals as 'on track or maintaining achievement' according to the Sustainable Development Goals Dashboard (2022). However, this is an assessment of only 3 criteria that excludes target 4.4 focused on increasing the youth with relevant skills for entrepreneurship.

The country assessment of gaps towards sustainable development highlighted a lack of entrepreneurship hindering local economic growth and limiting access to international markets (Ministry of Sustainable Development 2018). In terms of work, disengaged Sri Lankan youth who are not in employment, education or training yet actively seeking employment opportunities grew from 24% to 26% (Ministry of Sustainable Development 2018). To address these challenges, the government aims to promote entrepreneurship within the private sectors (Ministry of Sustainable Development 2018). Yet there is no active action plan that is facilitating the promotion of entrepreneurship in the ecosystem including higher education institutions. Further, the Sri Lankan higher education system face challenges relating to quality, relevance and capacity, urging youth to move overseas for better education (Dissanayake

2020). Therefore, there is urge for higher education institutions to improve the experience to develop the next generation of young entrepreneurs, contributing to Sri Lanka's national sustainable development.

3.4 Importance of quality education and entrepreneurship for youth

By region, South Asia is reported to suffer from the highest rate of unemployed youth aged between 15 and 24 years with 18.7% compared to 10.0% in Eastern Asia and 18.7% in South-East Asia countries and the Pacific in 2020 (International Labour Organization 2021). Amidst this crisis, South Asia is projected to have the world's largest youth labour force by 2040, potentially driving economies and societies for national development (UNICEF 2020). Within South Asia, Sri Lanka faces the challenge of the highest youth unemployment of 27.7% (Jayathilake 2020) compared to countries such as India 21.1%, Nepal 19.2% and Maldives 7.6% (International Labour Organization 2020).

Sri Lanka reports overall unemployment rates below 5% in recent years; however, the current downturn in economic activity due to the pandemic is predicted to cause job losses (World Bank 2020). Although the overall unemployment is commendable, youth unemployment has steadily increased over the last few years, from 16.7% in 2011 to 20.8% in 2019 (World Bank 2021). The youth unemployment rate is approximately four times the overall unemployment rate. The proportion of youth disengaged and not in employment, education or training of the total youth population amounts to 26% and is relatively high (Ministry of Sustainable Development 2018). High youth unemployment signifies underutilised human capital, which if employed, could improve economic growth and social development for Sri Lanka (Jayathilake 2020). The high level of youth unemployment has seen an increase in entrepreneurship and start-up activity (Wong et al. 2005).

UNICEF (2020) identified one major obstacle to increasing youth employment as low quality education is widening the skill gap. Sri Lanka's reported high youth unemployment implies a talent mismatch where youth do not participate in the labour market (Ministry of Sustainable Development 2018). Employers claim that they struggle to hire the talent they require as graduates lack the necessary skills for the job (Ministry of Sustainable Development 2018). Young unemployed graduates had the same perception, stating mismatch of knowledge and skills gained from academic qualifications and employer requirements as the second reason for being unemployed (Jayathilake 2020). However, most graduates believed that monetary and non-monetary rewards of available jobs did not match their expectations (Jayathilake

2020). These reasons were confirmed by a different study exploring youth unemployment that recognised one's career aspirations as a motivating factor and insufficient education as a barrier (Dissanayake 2020). Therefore, high youth unemployment and significant underutilisation of youth human capital in affected countries can be alleviated through investment in education and skill development (UNICEF 2020).

The Sri Lankan government had made efforts to address youth unemployment with initiatives at all education levels. For example, it incorporated skill development into the school curricula, introduced a technology stream of study, developed technology faculties at public universities, and encouraged youth to follow vocational training (Ministry of Sustainable Development 2018). 'Vision 25' and 'The Decent Work Country Program' are committed to increasing employment opportunities and re-skilling the labour force to meet socio-economic demands, with a focus on youth (International Labour Organization 2018). However, recent studies investigating unemployed youth in Sri Lanka found that interviewees are unaware of any government support to improve their employability skills and entrepreneurial opportunities (Jayathilake 2020; Dissanayake 2020). Youth with self-employment aspirations have the vision to start and grow a new venture, but they recognise that they lack the knowledge and skills to achieve it successfully (Dissanayake 2020).

3.5 Challenges faced by the Sri Lankan higher education sector

If an investment is made in skill development through education, South Asian countries can build on strong economic growth in the coming decades (UNICEF 2020). The Sri Lankan higher education sector is currently facing several barriers. Some of the key challenges the industry is facing include improve the quality and relevance of education and increase access to higher education (Ministry of Sustainable Development 2018) and they are discussed below. The poor education quality for youth in Sri Lanka, has resulted in a skill gap for 21st-century work.

3.5.1 Lack of quality and relevance

The government recognises the pivotal role that higher education plays in driving economic growth and social development for the nation (Ministry of Sustainable Development 2018). Higher education quality requires improvement, particularly increasing entrepreneurship and employability among youth (Ministry of Sustainable Development 2018). Next, the relevance of education calls for study programs and graduate capabilities to be aligned to national priorities, market needs and employer expectations (Ministry of Sustainable Development

2018). Given the national emphasis for encouraging entrepreneurship and increasing entrepreneurs (Ministry of Sustainable Development 2018), higher education institutions, both public and private, need to reform their education and environments for quality and relevance.

3.5.2 Capacity constraints in higher education

Access to higher education is another challenge for students in Sri Lanka (University Grants Commission 2022). The concern rises from statistics that reveal that only 18% of the 20- to 24-year-old population are enrolled in universities, campuses and institutes of the public higher education sector (Ministry of Sustainable Development 2018). The total tertiary education enrolments of Sri Lanka stand at 21%, and two reasons are identified as the cause of this low number of enrolments and limited access to higher education services (Ministry of Sustainable Development 2018). First, the public sector offers free education and this sector suffers from capacity constraints due to lack of funding and resources. The second reason is limited coordination with the private sector for involvement in the higher education system (Ministry of Sustainable Development 2018). Comparatively, countries such as China enforce a policy that allows public universities to charge fees to cover up to 25% of operating costs, which had a tripling effect on public university enrolments, increasing them from 6.1 million to 19.0 million by 2003 within six years (Gamage 2012).

Approximately 250,000 students take the advance-level examinations every year, and 150,000 of them qualify for higher education (University Grants Commission 2022). Due to the capacity constraints in the public system, more than 47,000 students did not have the opportunity to enrol in public higher education in the academic year of 2019/2020. Nearly 11,000 of these 47,379 students enrolled with private higher education institutions for paid higher education, and 12,000 left for undergraduate education in other countries (Sri Lanka Export Development Board 2018). The public higher education sector enrolls a higher number of students and produces a larger number of graduates than the private higher education institutions. However, the public higher education system is constrained in resources, limiting their capacity of service (Ministry of Sustainable Development 2018). Given the capacity constraint faced by public universities, a significant portion of students opt for private higher education.

3.5.3 Demand for private higher education

After decades of the widening gap between higher education demand and supply in Sri Lanka, opportunities to fill the gap have emerged. On the demand side, parents refuse to disadvantage

their child(ren) due to limited free education opportunities and they are willing to pay for higher education creating a demand for private higher education in Sri Lanka (Gamage 2012). This demand is driven by educated parents who influence their children to obtain higher education after completing their secondary education (Dissanayake 2020). For developing countries such as Sri Lanka, private investment in higher education and tuition fees have become imperative (Gamage 2012). This change of preference towards paid higher education increases overall access to higher education while emphasising a growing demand for private higher education.

In Sri Lanka, all private higher education institutions offer internationally awarded undergraduate degrees (Gamage & Wijesooriya 2011). The top 3 popular fields of study are Business/Management, Information Technology and Engineering with Business/Management being the majority choice for higher education (Gamage & Wijesooriya 2011). Sri Lanka is behind the rest of the world in terms of private higher education while the institutions have expanded rapidly globally (The World Bank 2019).

3.5.4 Government policy interventions

Government support may improve entrepreneurship education's efficiency and effectiveness, especially in developing countries (Yu et al. 2017). A study among undergraduates in Sri Lanka found that higher education institution support positively influences student entrepreneurial intentions (Lin et al. 2013). By making entrepreneurship education available to youth, higher education institutions can prepare a new wave of graduate entrepreneurs for socio-economic impact (Volkman et al. 2009). This explains why entrepreneurship education has received growing recognition, especially among developing countries (Nabi & Linan 2011).

In Asian countries such as China, Taiwan and Singapore, governments have actively enforced policies to accelerate entrepreneurship education (Yu 2018; Yu et al. 2017). For example, the Chinese government and political system have strongly influenced entrepreneurship education. The Chinese government has launched entrepreneurship programs at almost every university, and universities have access to financial support from the government (Yu 2018). Although this practice is common among many Asian nations (Yu et al. 2017), it has not attracted the attention of policymakers in terms of interventions related to the private higher education in Sri Lanka. While public universities play a more active role by offering entrepreneurship education and supporting entrepreneurial initiatives, private higher education institutions may want to take some responsibility to scale up and align their HEEEs to national priorities, including youth entrepreneurship.

3.5.5 Human capital development

The COVID-19 pandemic posed significant challenges to human capital worldwide (Ratten and Jones 2020). Recovery from the pandemic urges a stronger commitment in human capital development which focuses on capabilities and systems to rebuild from the shocks (United Nations Sri Lanka 2022). After the pandemic reversed the human capital development gains, Sri Lanka is experiencing a political and economic crisis (United Nations Sri Lanka 2022). Human capital challenges are exacerbated by the existing lack of quality education and capability development (Ministry of Sustainable Development 2018). Sri Lanka ranks 71st among 174 countries in the 2020 World Bank Human Capital Index as the highest in South Asia. Yet there is significant gap within higher education where Sri Lanka's competitiveness will be affected by the education and capabilities of the workforce in the 21st century (International Finance Corporation 2022). As individual interventions can only go so far, the entrepreneurial ecosystems including higher education institutions need to focus on the human capital challenges (Maritz et al. 2020). As the developing economy must rebuild and reshape their futures, human capital development could support a resiliency recovery and growth opportunities lies in leveraging its human capital (United Nations Sri Lanka 2022). The multiple crisis in the last three years changes many dynamics, however, the study acknowledges the situation and continues to be relevant for Sri Lanka to recover and rebuild. Higher education and their HEEEs are increasingly important for human capital development of youth.

3.6 Entrepreneurship education in Sri Lanka

The trajectory of entrepreneurship education began in the school system when the subject was newly introduced to the Sri Lanka secondary curriculum (Weerasinghe 2020). Entrepreneurship education has a positive influence on the entrepreneurial intention of school children and undergraduate students (Weerasinghe 2020). When explored among public universities, knowledge about entrepreneurship was found to have a strong effect on students' entrepreneurial intentions (Gunawaredane & Weerasinghe 2021).

Among the four public universities with the longest history in Sri Lanka, the University of Sri Jayewardenepura offers a BSc in Entrepreneurship while the University of Moratuwa promotes a MBA in Entrepreneurship and Innovation. Whereas the University of Peradeniya and the University of Kelaniya do not seem to offer any entrepreneurship education programs. This limited availability of entrepreneurship education highlights the disconnect between

national needs and higher education offerings. Similarly, entrepreneurship education in the private sector is still emerging with only a few institutions offering first degrees in entrepreneurship. The American National College, affiliated to Northwood University (US), is one of the first private higher education institutions to offer a BA in Entrepreneurship while the Asia Pacific Institute of Information Technology recently launched a BSc in Entrepreneurship and Innovation early 2022, which is awarded by Staffordshire University (UK). Although Business/Management is the most common discipline of undergraduate study, entrepreneurship is yet to become popular.

Sri Lanka as a nation strives towards the SGDs, including Target 4.4 which focuses on increasing the number of youths with relevant skills for entrepreneurship (Ministry of Sustainable Development 2018), and there is evidence that entrepreneurship education positively influences the entrepreneurial intention of undergraduate students (Weerasinghe 2020; Lin et al. 2013). An experimental study in Sri Lanka found that offering entrepreneurship education can add value in multiple ways, including the development of relevant capabilities at undergraduate level (Kasturiratne, Lean & Phiooen 2012). If this is the case, public universities and private higher education institutions should offer study programs in entrepreneurship for youth; however, this is not largely evident. The lack of importance placed on E&I among public universities was explained by the reason that they are mostly unaware of their multiple roles, particularly teaching, research and entrepreneurship (Weerasinghe & Jayewardane 2018). When there is a tendency towards E&I, resource constraints limit their actions (Weerasinghe & Jayewardane 2018). The benefits of entrepreneurship advocated in developed economies and the Western context are found to be less desirable in the unique context of Sri Lanka (Lin et al. 2013). Stakeholders responsible for education are urged to understand the importance of entrepreneurship education and promote the discipline among students in Sri Lanka (Weerasinghe & Jayewardane 2018).

3.7 Entrepreneurial ecosystem in Sri Lanka

Entrepreneurship is a key driver for Sri Lanka's sustainable development (Ministry of Sustainable Development 2018). In global ranking among 137 countries, Sri Lanka is ranked 90th in the Global Entrepreneurship Index for 2018 (Global Ecosystems Dynamics Investigation 2020). SMEs contribute to 52% of the country's GDP and account for 45% of the nation's total employment (KPMG 2020). Sri Lanka claims that its start-up economy is valued at almost USD 60 million (LKR21.8 billion), which has quadrupled in two years (Startup

Genome 2021). Sri Lanka ranks among the top three for affordable talent in the Asia-Pacific region, where talent is a key strength of start-up ecosystems (Startup Genome 2021).

Sri Lanka is ranked 85th in the World Bank's Starting a Business index, which is better than the rankings of other South Asian countries such as India at 136, Nepal at 135 and Bangladesh at 131, among 190 economies (World Bank 2020). This recognition is achieved through various government initiatives to encourage entrepreneurship in Sri Lanka. For example, business registration moved to a fully automated and web-based process called 'e-registration' for quick and convenient service for entrepreneurs forming a new venture (Department of the Registrar of Companies 2020). Second, an initiative called the 'Enterprise Sri Lanka' credit program offers youth subsidised loans amounting to approximately USD250 to USD3,800,000 (LKR50,000 to 750,000,000) to finance business ventures (Department of Development Finance 2018). Third, 'Spiralation', a tech start-up support program, and 'Disrupt Asia', a start-up conference, are government-funded programs for entrepreneurs with start-up exposure through a network of investors, accelerators and mentors (ICTA 2020). The country is becoming attractive as a destination to expand businesses, with international start-ups such as Oyo recently established (PricewaterhouseCoopers 2019).

Sri Lanka is inclined towards technology-driven entrepreneurship as the government strives for a technology-based economy (KMPG 2020). As a result, the highest representation of start-ups is in technology-focused services and products followed by e-commerce and mobile applications (ICTA 2020). Numerous government initiatives have been made across the education sectors, emphasising the development of technical skills for the growing tech start-ups (Ministry of Education 2016; Ministry of Sustainable Development 2018). SLASSCOM, the national chamber for the information technology (IT) industry, estimates Sri Lanka to have 1,000 tech start-ups in 2022. This growth in new ventures has happened even amid the pandemic, as e-commerce platforms are increasingly adopted (KMPG 2020). The Sri Lankan government has imposed a tax-free policy for technology start-ups (Startup Genome 2021). Significant growth is recognised in sub-sectors, including cleantech, agtech and new food sectors (Startup Genome 2021). In addition to tech-based sectors, start-ups have entered industries of consumer durables, apparel, financial services, education, consulting and engineering (KMPG 2020).

Given the indicators in Table 3.1, Sri Lanka appears to rank better than most of the comparable countries in Asia and South Asia. When considering the Global Entrepreneurship

Index ranking for 2018, Sri Lanka is behind India, Philippines and Vietnam and ahead of Indonesia, Cambodia, Myanmar, Pakistan and Bangladesh. In the case of the Starting a Business ranking for 2020, only Myanmar and Pakistan are in front of Sri Lanka. According to a Startup Genome Report (2021), India (Mumbai, 1st), Indonesia (Jakarta, 2nd), Philippines (Manila, between 31 and 40) and Vietnam (Ho Chi Minh City, between 71 and 80) are among the top 100 emerging entrepreneurial ecosystems. The entrepreneurial ecosystem of Sri Lanka benefits from an advantageous geographic location, high literacy levels, technical expertise and internet infrastructure (KPMG 2020). However, Sri Lanka has not still made it on this list or rankings such as Top 30 Global Ecosystems or Challenger Ecosystems by Startup Genome (2021).

Table 3.1 – Summary of entrepreneurship related indicators

	Global Entrepreneurship Index ranking for 2018 (out of 137)	Global Entrepreneurship Index for 2018 (out of 100)	Starting a Business ranking for 2020 (out of 190)	Starting a Business score for 2020 (out of 100%)
Sri Lanka	90	21.9	85	88.2
<i>With Southeast Asia</i>				
Cambodia	113	17.6	187	52.4
Indonesia	94	21	140	81.2
Myanmar	127	13.6	70	89.3
Philippines	84	24.1	171	71.3
Vietnam	87	23.2	115	85.1
<i>With South Asia</i>				
India	68	28.4	136	81.6
Pakistan	120	15.6	72	89.3
Bangladesh	134	11.8	131	82.4
Bhutan	n/a	n/a	103	86.4

Source – Global Entrepreneurship Index (2020) and World Bank (2020)

3.8 Entrepreneurs’ profile and perceived key success factors

3.8.1 Characteristics of start-up entrepreneurs

A recent study relating to entrepreneurship was conducted in Sri Lanka to provide an understanding of the characteristics of entrepreneurs (refer Figure 3.6). Sri Lankan entrepreneurs forming start-ups are young (33% in the age category of 25–29 years), educated (73% holding a bachelor’s degree or above and 30% are after their first degree), and are predominately male, with an 87% representation (PricewaterhouseCoopers 2019). The bulk of

entrepreneurs are from Computer Science (40%) and Business Management (31%) programs. Their reasons for embarking on a new venture range from having an innovative idea (29%), control/independence (23%), flexibility (19%), financial motivation (15%) and being inspired by others (15%) (PricewaterhouseCoopers 2019). The geographical representation shows that 92% of start-ups are located in the western province, including the Colombo district (PricewaterhouseCoopers 2019).

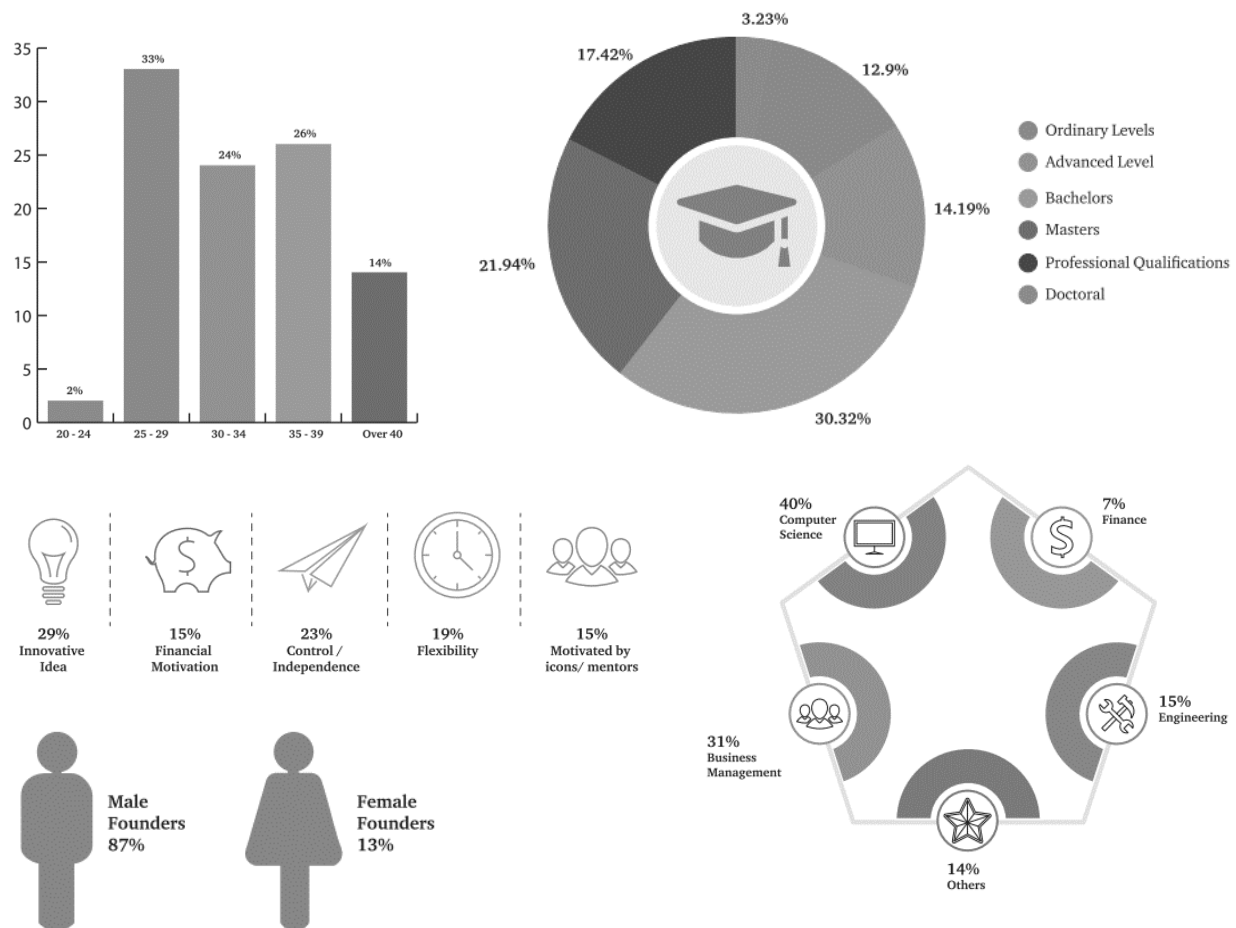


Figure 3.6 – Characteristics of start-up entrepreneurs

Source – PricewaterhouseCoopers (2019)

3.8.2 Reasons for start-up success and failure

When investigating factors that enable start-ups to succeed in Sri Lanka, young entrepreneurs revealed ‘skills and expertise’ as the most important (PricewaterhouseCoppers 2020). Other contributing factors were the regulatory environment, pro-entrepreneurship culture, support from family and friends, guidance from experienced entrepreneurs and experts, and role models/successful start-ups (PricewaterhouseCoppers 2020). The most important factor of

‘skills and expertise’ relates to the top reasons why start-ups fail in Sri Lanka. Although Sri Lanka has a higher rate for starting a business among South Asian countries, start-ups in Sri Lanka have a high failure rate (Gunasekara 2020).

According to investors and mentors, ‘lack of market research’, ‘insufficient business acumen’ and ‘lack of commitment’ are key issues that drive new ventures to fail (PricewaterhouseCoppers 2020). For instance, entrepreneurs design products without considering end-user requirements, launch ventures that do not solve a problem, and limit research to secondary data instead of conducting market research (PricewaterhouseCoopers 2020). These reasons for failure can be identified as individual factors related to entrepreneurs. Thus, entrepreneurship education is critical in developing capabilities, which is the basis for economic growth and societal change (Volkman et al. 2009). These are clear signs of the need for higher education institutions, both public and private, to develop their students with the capabilities necessary to create self-made career paths and pursue entrepreneurship. It is crucial for Sri Lanka’s next generation of undergraduates to have the knowledge, skills and attitudes to create, launch and successfully manage new ventures and transform the country’s operating industries. Furthermore, developing capabilities in entrepreneurship not only benefits potential entrepreneurs but also for intrapreneurs in multiple occupations in the corporate sector (Alsos et al. 2022). Therefore, there is scope for an exploratory study how can develop capabilities.

The above sections established an overview of the country context of this research, given its importance for contextualising HEEEs. Further, as stated by Brännback et al. (2007), contextualisation diverges from generalisability. However, empirical findings from this study can be generalised to resource-constrained countries with similar characteristics and conditions as Sri Lanka.

3.9 Chapter summary

This chapter provided a detailed overview of Sri Lanka and its higher education sector. In addition to this study, scholars including Kodithuwakku and Rosa (2002), Lin et al. (2013) and de Silva, Uyarra and Oakey (2012) have previously framed Sri Lanka as a resource-constrained environment when investigating entrepreneurship-related problems. This contextualisation chapter established the socio-economic conditions that allow scholars to relate other developing countries to this study. The importance of quality education and entrepreneurship was highlighted through the prolonged challenge of youth unemployment in Sri Lanka. A key issue that surfaced during a national review of sustainable development was the lack of entrepreneurship impeding local growth and access to international markets (Ministry of Sustainable Development 2018). This same review found key challenges of public higher education sector relating to quality, relevance and capacity. The section on challenges of the higher education section justifies the focus of this study on private higher education institutions. The last section of the chapter offers an understanding on the type of entrepreneurs creating start-ups in Sri Lanka and their individual factors driving start-ups to failure.

CHAPTER 4: THEORETICAL FRAMEWORK

4.1 Chapter overview

In qualitative research, it is suggested that scholars use theories as a lens through which the literature and data are viewed, and avoid the overreliance on theory that may limit the ability to find emerging findings (Collins & Stockton 2018). This chapter illustrates the theoretical scaffolding upon which the study is built and refers to existing theories and debates relevant studies. First, the chapter begins with an overview on the use of theory applied to the HEEE concept and in this study. Second, the four existing theories (student involvement theory, systems theory, social capital theory and theory of effectuation) are discussed to establish their use in relevant studies and the relationships for this study. In these sections, the theoretical framework begins to develop, and the final theoretical framework for this study is illustrated at the end of the chapter. This chapter is followed by a chapter contextualising the research in a resource-constrained environment.

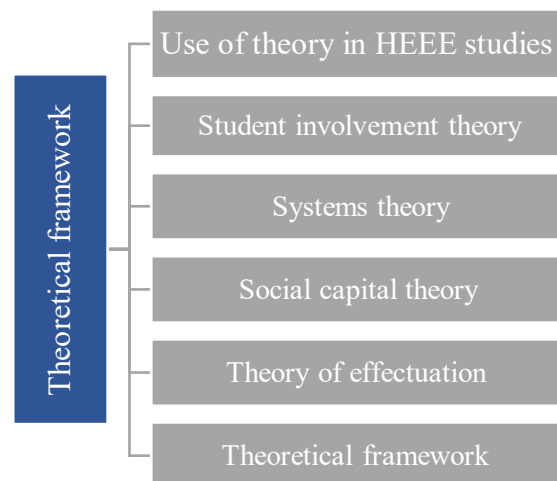


Figure 4.1 – Chapter 3 outline

4.2 Use of theory in HEEE studies

This study contributes to the research domain of HEEEs. As an emerging concept that is theoretical and empirical clarity (Hsieh & Kelley 2020; Longva 2021), prior HEEE studies have drawn on theories and logic from the management, organisational and psychology disciplines. Similar to entrepreneurial ecosystem, HEEEs are perceived to be of multidimensional nature, comprising ‘actors’ and ‘factors’. Thus, this study applies selected theories in a multidimensional approach as the logics of a single theory will not serve the

research aim and objectives. In this case, multiple theories related to entrepreneurial ecosystems, student development and stakeholder engagement were applied to an overarching framework.

Existing studies demonstrate a variety of theories that have been applied to the concept of HEEEs. The resource-based view (Rice, Feters & Greene 2014), Turner's frontier thesis (Miller & Acs 2017), the triple helix (Shil et al. 2020) and stakeholder theory (Meyer et al. 2020) are some of the theories in HEEE studies. Next, studies taking a focus on entrepreneurship education or entrepreneurial support in the context of HEEEs have used the theory of planned behaviour (Guerrero, Urbano & Gajón 2017; Webber, Kitagawa & Plumridge 2020), social capital theory (Theodoraki, Messeghem & Rice 2018) and institutional theory (Lahikainen et al. 2019). As HEEEs are emerging, different theories have played a role in the conceptual and theoretical development. Further, a single theory was not repeated in another study with the intention of advancing on the findings of previous HEEE studies. In contrast, key scholarly work on entrepreneurial ecosystems is observed to maintain consistency by using systems theory across five different studies during almost a decade of investigation (Stam 2015; Feld 2012; Isenberg 2011; Cohen 2006; Neck et al. 2004). From a theoretical standpoint, it is suggested to reduce the development of alternative models and attempt to integrate cumulative knowledge instead (Shook et al. 2003). Leading from this rationale, this study explores HEEEs using existing theories that are relevant to the key interests of the study.

Development of a highly evolved HEEE can take alternative pathways (Rice, Feters & Greene 2014). This study focuses on the development of HEEEs towards student capabilities in a resource-constrained environment, through diverse stakeholder perspectives. When establishing the theoretical framework for this study, the research problem, questions and objectives provide a clear rationale for the choice of theories (Grant & Osanloo 2014). Before arriving at the existing four theories discussed in the following sections, other theories are also considered and assessed for their relevance to the study.

4.3 Systems theory

This study involves the intersection of entrepreneurial universities (also known as higher education institutions) and entrepreneurial ecosystems contributing to the research domain of HEEEs. The research problem is drawn from the grand challenge of lack of quality education, where SDG 4.4 targets increasing the number of youths who have relevant entrepreneurship skills by 2030 (United Nations 2020). In response, this study aims to contribute to HEEEs for

capability development in a resource-constrained environment. With the key focus on capability development through the perspectives of diverse stakeholders, the central theory framing this study is systems theory.

The notion of systems, which is as old as European philosophy, explains how organised groups are interrelated parts, influenced by their environment (Von Bertalanffy 1972). In this essence, the statement “The whole is more than the sum of its parts” by Aristotle defines a basic system. At a national level, entrepreneurial ecosystems contribute to economic growth and their factors and actors are interconnected as a system (Acs, Autio & Szerb 2014; Acs, Mickiewicz & Szerb 2018). Entrepreneurial ecosystems draw upon systems theory where scholars explore and examine the development of these systems, their composition and configuration as well as their complex and interconnecting functioning (Stam 2015; Feld 2012; Isenberg 2011; Cohen 2006; Neck et al. 2004). There are few studies investigating the interdependencies of the different factors that form the entrepreneurial ecosystem (Roundy, Bradshaw & Brockman 2018). In this case, entrepreneurial ecosystem literature provides a lens through which HEEEs can be viewed from a systems perspective.

Higher education institutions should function within their environment including the ecosystems that are structured with a systematic perspective. First, higher education institutions embrace university–industry–government relations suggested by Etzkowitz and Leydesdorff (2000) where the three stakeholder groups representing academia, business and state associate, creating a national innovation system. These mode 3 higher education institutions are open, highly complex, and non-linear knowledge production systems that demand a strong association with the entrepreneurial ecosystem (Carayannis et al. 2018 p146). Second, entrepreneurial ecosystems represent a set of individuals and organisations including universities, industry and organisations (Carlsson et al. 2002; Mason and Brown 2014). Higher education institutions were recognised as a domain of entrepreneurial ecosystems that represents the integration of these institutions within national systems (Isenberg 2010). These institutions do not operate in isolation and are embedded in specific environments, including entrepreneurial ecosystems where there is collaboration as well as competition for constrained resources (Carayannis et al. 2018). These notions explain how higher education institutions and their HEEEs should be considered as part of the wider entrepreneurial ecosystem.

Entrepreneurial ecosystems have frequently been conceptualised as a system from a systems theory perspective. HEEE literature, on the other hand, has focused on self-sustaining ecosystems with less emphasis on their interdependency with the wider entrepreneurial ecosystem. Studies such as by Autio et al. (2014), Lahikainen et al. (2019) and Rice, Fettes and Greene (2014) positioned HEEEs as self-sustaining ecosystems following the notion that they are independent. However, HEEE began to be conceived as closely connected to their entrepreneurial ecosystems (Feldman, Siegel and Wright 2019). In this study, HEEEs are considered a sub-ecosystem of the wider entrepreneurial ecosystem. Similar to how Fayolle (2013) highlighted that society is the client of entrepreneurial ecosystems, the customer of HEEEs is the society in which it is embedded, including the various external stakeholders. Further, higher education institutions as open systems have the notion of exchange with the environment, which is also the ecosystem, as every living system (Von Bertalanffy 1972). Acknowledging the importance of learning and entrepreneurial outcomes meeting the economic and social needs of stakeholders and the ecosystem, the HEEE is embedded within the wider entrepreneurial ecosystem interconnected as one system as shown in Figure 4.3.

4.4 Student involvement theory

Astin (1999) proposed the student involvement theory, which has received academic attention since the mid-1990s (Trowler & Trowler 2010). Student involvement theory emphasises how desirable outcomes by higher education institutions are viewed in relation to how students change and develop as a result of being involved in activities within the institution's environment (Astin 1999). This theory accentuates students' behaviour and has historical roots in literature as a developmental theory for higher education (Lahikainen et al. 2021). As students' involvement is a crucial pillar to the higher education experience, the student involvement theory is known as a useful theory to help the management of higher education institutions to design a more effective learning environment for better student involvement and engagement (Astin 1999). This benefit of the student involvement theory resonates well with the research that intends to direct higher education institutions on designing and developing their HEEEs in a resource-constrained environment, in consideration of diverse stakeholder perspectives.

Student involvement theory places the importance on students and students being actively involved in the learning process within the higher education environment (Astin 1999). While some scholars argue that the only way to make students more entrepreneurial is by taking

a learning-by-doing approach (Lackéus 2015), this theory helps higher education institutions recognise how to motivate students to get involved. Developmental theories generally tend to primarily focus on the developmental outcome whereas student involvement theory is unique as it shifts the concentration to the behavioural process that facilitates student development (Astin 1999). As this theory emphasises the ‘how’ of student development, framing the study with this theory at the centre allows the exploration of the overarching aim of how can HEEEs develop students for E&I in a resource-constrained environment.

Key scholarly work in the entrepreneurial ecosystem literature including Stam (2015), Feld (2012), Isenberg (2011), Cohen (2006) and Neck et al. (2004) demonstrates the consistent use of systems theory, building on theory for entrepreneurial ecosystems. The core principle of the student involvement theory is also based on the similar characteristics of systems theory, being inputs, environment and outcomes with five basic assumptions about students’ involvement (Astin 1999). First, Astin (1999) argues that student involvement refers to an investment of psychological and physical energy. Second, student involvement is continuous along a continuum and distinct for each student. Third, student involvement may be qualitative and quantitative. Fourth, student development is proportionate to student involvement. Fifth, student involvement relates to the effectiveness of activities. Such students devote their energy to studying, spend their time physically on campus, actively participate in various student organisations and frequently interact with stakeholders such as peers and educators (Astin 1999). These five propositions are discussed with empirical data in Chapter 7.

Astin’s (1999) student involvement theory enables researchers to explore student development within the higher education environment. This study is framed using Astin’s (1999) student involvement theory that enables the exploration of student development in the HEEE context. A recent study in Germany investigated how entrepreneurship education ecosystems shaped the innovative capabilities of undergraduates using this theory at the centre (Bock et al. 2020). This study can be identified as one of the first to associate ecosystems in higher education to student development. Bock et al. (2020) found that students’ innovation capabilities are influenced by contextual factors including functional experiences and connecting experiences. While this is a noteworthy contribution, this investigation was within the context of an entrepreneurship education ecosystem, focused on entrepreneurship education and not scoped to HEEEs for entrepreneurship education and entrepreneurial support. Building on the initial findings of Bock et al. (2020), this study applies student involvement theory as

the core theoretical frame and investigates at a deeper level through qualitative research with diverse stakeholders that would enumerate student development within HEEEs.

The student involvement theory is expressed as a progressive flow of inputs → environment → outcome (refer Figure 4.2). First, the theory gives prominence to students and their existing characteristics as they enter higher education (Astin 1999). With this input, it is possible to evaluate how student characteristics such as demographics, background and previous experiences play a role in the development process (Astin 1999). In previous studies, students' existing characteristics, such as their demographics, prior E&I experiences and parents' E&I experiences, have been investigated (Webber, Kitagawa & Plumridge 2020). However, these individual-level factors are beyond the scope of this research, therefore it is understood that input is the student entering higher education for the purpose of obtaining a bachelor degree. Next, the theory brings attention to the environment of the higher education institution which accounts for all the experiences a student would have during higher education (Astin 1999). Factors and mechanisms of the HEEE can be considered as activities that students involve and experience. Last, the theory leads to outcomes that students achieve in the form of student characteristics, knowledge, attitudes and values at the point of graduation (Astin 1999), which is considered as capabilities development in this study.

This theory frames the study by enabling exploration of how HEEEs can develop students for E&I in a resource-constrained environment. According to this framing (refer Figure 4.2), student involvement theory garners student development including capabilities, addressing how HEEEs can develop the student during their study period.

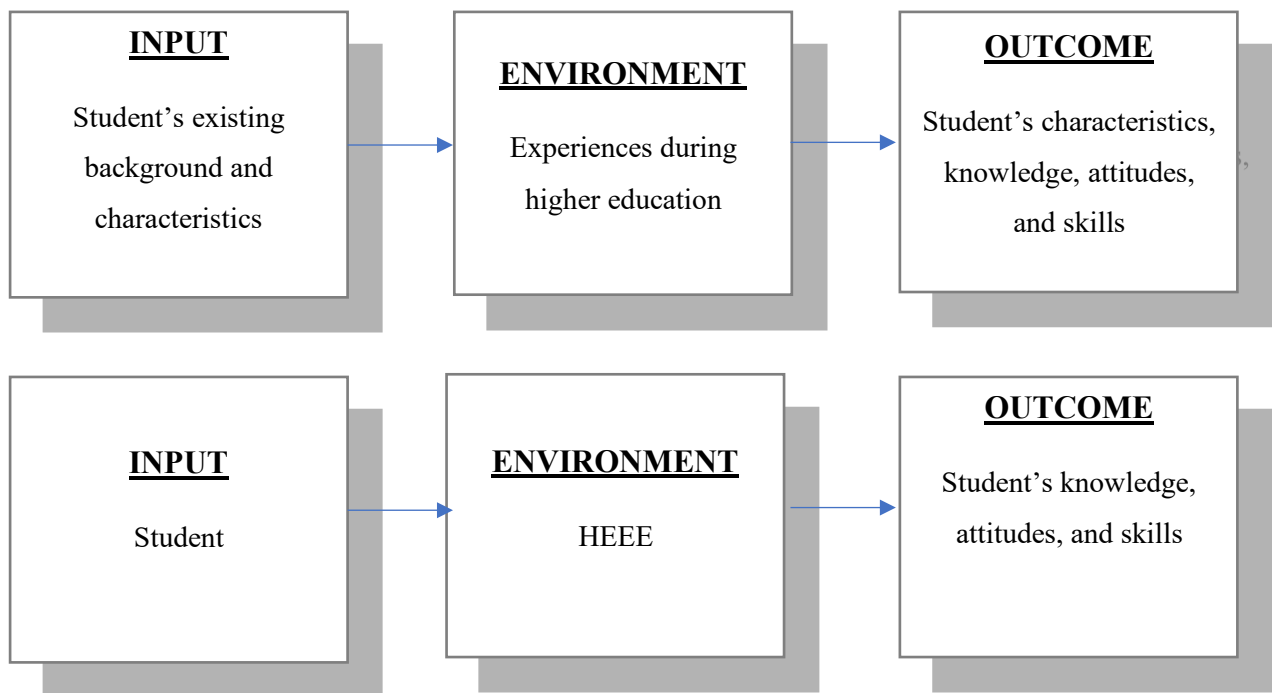


Figure 4.2 – Astin's student involvement theory and framing to this study

Sourced and adapted from Astin (1999)

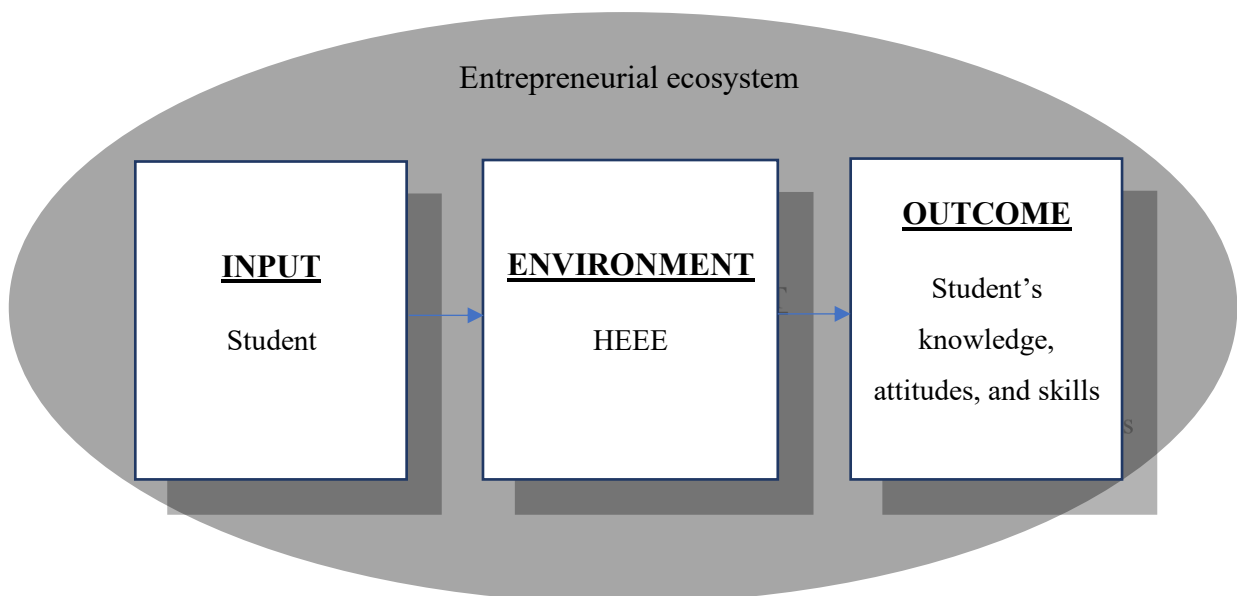


Figure 4.3 – Framing systems theory to this study

4.5 Social capital theory

Social networks draw from the notions of systems theory with the assumption that stakeholders (also known as actors) are embedded in the environment and should be explored holistically. Systems theory emphasises the interconnectedness of stakeholders within a system and the importance of these actors interacting and collaborating in a system (Freeman 1984). This can be related to entrepreneurial ecosystems and HEEEs, where stakeholder groups form social networks interconnected in the ecosystem. When conceptualising social networks for this study, stakeholder groups are found in the HEEE and wider entrepreneurial ecosystems, directly or indirectly influencing student E&I capabilities (refer Figure. 4.4)

Social network theory is a network theory important for theoretical development in the field of entrepreneurship (Stuart & Sorenson 2005; Elfring & Hulsink 2003; Jack & Anderson 2002). This theory suggests that stakeholders construct their social environment by building relationships and is commonly used to explore stakeholder interactions within and between ecosystems (Hayter et al. 2016; Clarysse et al. 2014). A few entrepreneurial ecosystem studies, such as by Neumeyer et al. (2019), Pittz et al. (2019) and Neumeyer and Santos (2018), have applied social network theory, where stakeholders were examined among various ecosystem factors and their connectivity.

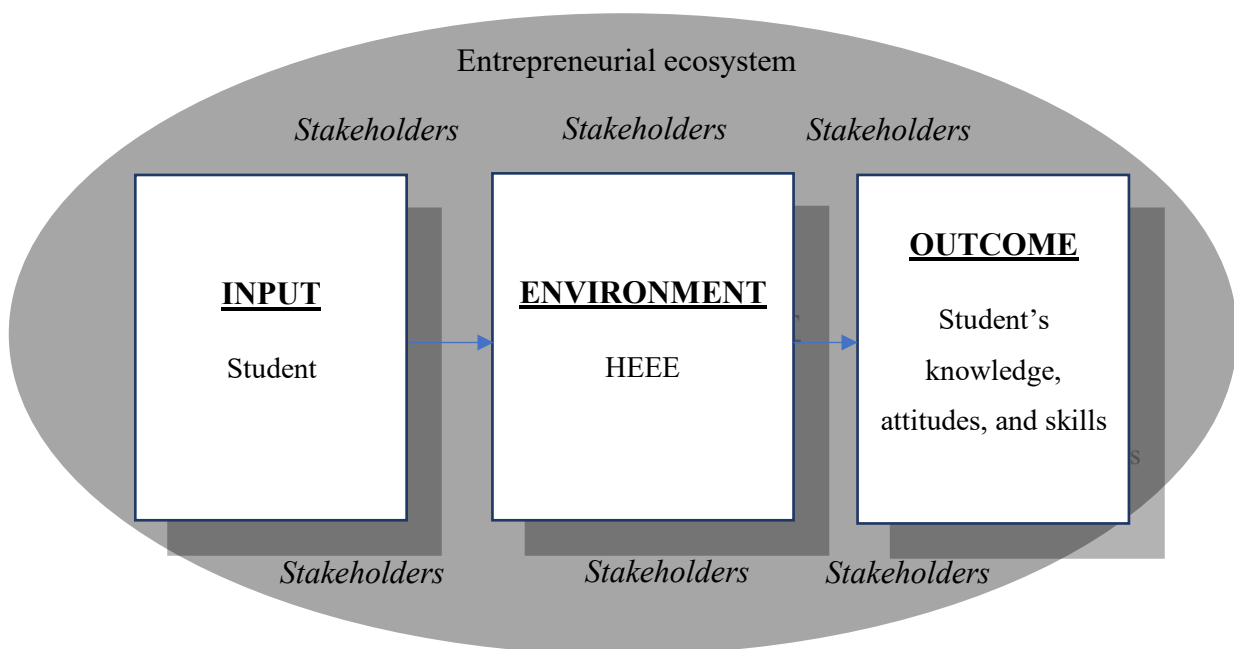


Figure 4.4 – Framing social capital theory to this study

In contrast, little association is made to network theories in HEEE literature. A recent study framed social network theory to explore social networks in the student-to-entrepreneur transition within the HEEE (Longva 2021). This study found certain factors including curricular activities, co-curricular activities, infrastructure and incubators are perceived as important for student start-ups by student entrepreneurs, educators and support actors in the ecosystem. The same study also established that students gain access to ideas, resources and identity through their social network within the HEEE. Yet scholars including Lahikainen et al. (2019), Miller (2011) and Rice, Fettes and Greene (2014) have identified HEEEs more as independent systems. In contrast, Longva (2021) argues that the HEEE needs to integrate and interact with the wider entrepreneurial ecosystem to function well, just like in a biological community of organisms.

This study explores HEEEs in a resource-constrained environment and in such environments, networks have been identified as underdeveloped and social capital is scarce (Bedő, Erdős & Pittaway 2020). Social capital refers to resources that emerge from structure and networks which are exploited for specific actions (Lin 1999). Entrepreneurs with social capital from diverse networks can benefit from support through their connections, which results in becoming successful with their start-ups (Song et al. 2021). Social capital is embedded within a network of mutual connections and social capital theory involves a network of social relationships forming a valuable resource for the conduct of affairs (Anderson & Jack 2010). Social capital theory and social network theory are closely related as both theories resonate on benefits gained from members within the social network (Ramos-Rodríguez et al. 2010).

In using social capital theory, scholars such as Theodoraki, Messeghem and Rice (2018) argue that all three dimensions of social capital – structural, cognitive and relational – are relevant for the HEEE to function effectively. Taking an emphasis of incubators within the HEEE, it was found that the structural dimension improves access to resources, the cognitive dimension strengthens the relationship among stakeholders, and the relational dimension increases the complementarity and trust of stakeholders (Theodoraki, Messeghem & Rice 2018). The same study found that developing and applying the three social capital dimensions has potential to improve benefits for stakeholders. For this reason, this study investigates how stakeholder engagement can be beneficial for students and their capability development, in particular, using social capital dimensions.

Networks are found to be important for knowledge ecosystems in terms of gaining competitive advantage (Clarysse et al. 2014). Social capital created through these networks provide unique resources and capabilities within the environment (Cruz, Howorth & Hamilton 2013). Scholars such as Theodoraki, Messeghem and Rice (2018) and Hayter et al. (2018) suggest higher education institutions be explored using social network and capital theories when investigating their ecosystems. Prior studies including by Theodoraki, Messeghem and Rice (2018) are focused on HEEEs, with an emphasis on incubators. The conceptualisation of this research inquires as to how diverse stakeholders engage within factors of HEEEs for students' capability development. Through a lens of social capital through social networks within HEEEs, this research explores the ways stakeholders can interact and benefit students within the HEEE. In particular, it shows how stakeholder engagement can develop students, the potential entrepreneurs. While student involvement theory is central to the theoretical framework, social capital is a multidimension being explored.

4.6 Effectuation theory

Effectuation theory, by Sarasvathy (2001), is a decision-making logic that explains how entrepreneurs think, make decisions, behave and act entrepreneurially by creating start-ups and new ventures. Jiang and Ruiling (2019) related effectuation to the 'black box', which is the mind of an individual where effectuation takes place. The concept of the black box is common in marketing literature, where it is referred to as the brain of a customer/consumer (Kotler 1967). Sarasvathy (2001) investigated expert entrepreneurs to understand how they discover and capture new opportunities in their entrepreneurial journey. Effectuation expresses a logic of thinking including a set of means and selecting between possibilities that can be created with that set of means and control (Sarasvathy 2008). A main criticism of effectuation is that it is not a theory (Arend et al. 2015). Sarasvathy (2008) articulated that effectuation is a logic of entrepreneurial action rather than a theory to be tested and proved.

Effectuation refers to new venture creation where entrepreneurs begin the entrepreneurial process and career goals are based on the means that involve 'who I am', 'what I know' and 'whom I know' (Sarasvathy 2001). This effectuation logic appeals to different audiences including the education setting (Frank & Landström 2016) and has been discussed as a practical approach to teaching entrepreneurship to students (Lackéus 2015). Potential entrepreneurs ask three questions related to personal identity (who I am), knowledge (what I know) and networks (whom I know) which leads to 'What can I do?' to image the possibilities

of creating a new venture. These are individual-based antecedents where the means including ‘what I know’ and ‘whom I know’ are directly related to the research questions and are explored, whereas the ‘who I am’ question is beyond the scope of this study.

Effectuation logic is an interesting way to frame research in the field of entrepreneurship, presenting a new perspective (Frank & Landström 2016). Efforts to incorporate effectuation in entrepreneurship education literature are apparent with the focus of capability building (Towers et al. 2020). A recent study encouraged future research in entrepreneurship to connect the theory of effectuation with other psychological theories, helping to build effectuation as a burgeoning theory (Zhang et al. 2021). When using effectuation, career goals such as becoming an entrepreneur emerge by developing potential courses of action that are based on means, such as what they know (Sarasvathy 2001). A review on the principal topic of effectuation by Grégoire and Cherchem (2019) suggested that new research should map the ‘means’ held among potential entrepreneurs during the early stages of E&I efforts. Mapping the means of potential entrepreneurs allows us to pay attention to the personality of the entrepreneur, an important view that is often overlooked when focusing on what entrepreneurs create (Sarasvathy 2022). This ‘human action’ direction is pursued in this study, where student capability development is associated with ‘means’, connecting the HEEE to the effectuation process (refer Figure 4.5).

Capabilities of entrepreneurs are central to the creation and success of start-ups (Gümüsaya & Bohnéc 2018). Higher education institutions are capable of developing student entrepreneurial talent with their HEEEs (Rice, Fetters & Greene 2014). When examining expert and novice entrepreneurs, it was found that students who are beginners use a predictive framework as effectuation, rather than experts who pay less attention to predictive information (Dew et al. 2019). In the event of learning to become an entrepreneur, effectuation is a relevant logic when developing entrepreneurial capabilities (Fayolle & Gailly 2008) and facilitating opportunity recognition (Sarasvathy 2001) for would-be entrepreneurs. However, effectuation is means driven for taking enterprising action without limiting to becoming an entrepreneur (Kautonen, Gelderen & Fink 2015). One study applied effectuation in the HEEE context, examining some factors including curricular, co-curricular activities and financial support (Shirokova et al. 2017). However, more research on HEEEs needs to apply the effectuation logic (Belitski 2019). In conceptualising effectuation for this study, there is an opportunity to explore capability development within the HEEE related to the means as an input of the

entrepreneurial process. This may allow us to understand the interdependencies of HEEEs in the wider entrepreneurial ecosystem.

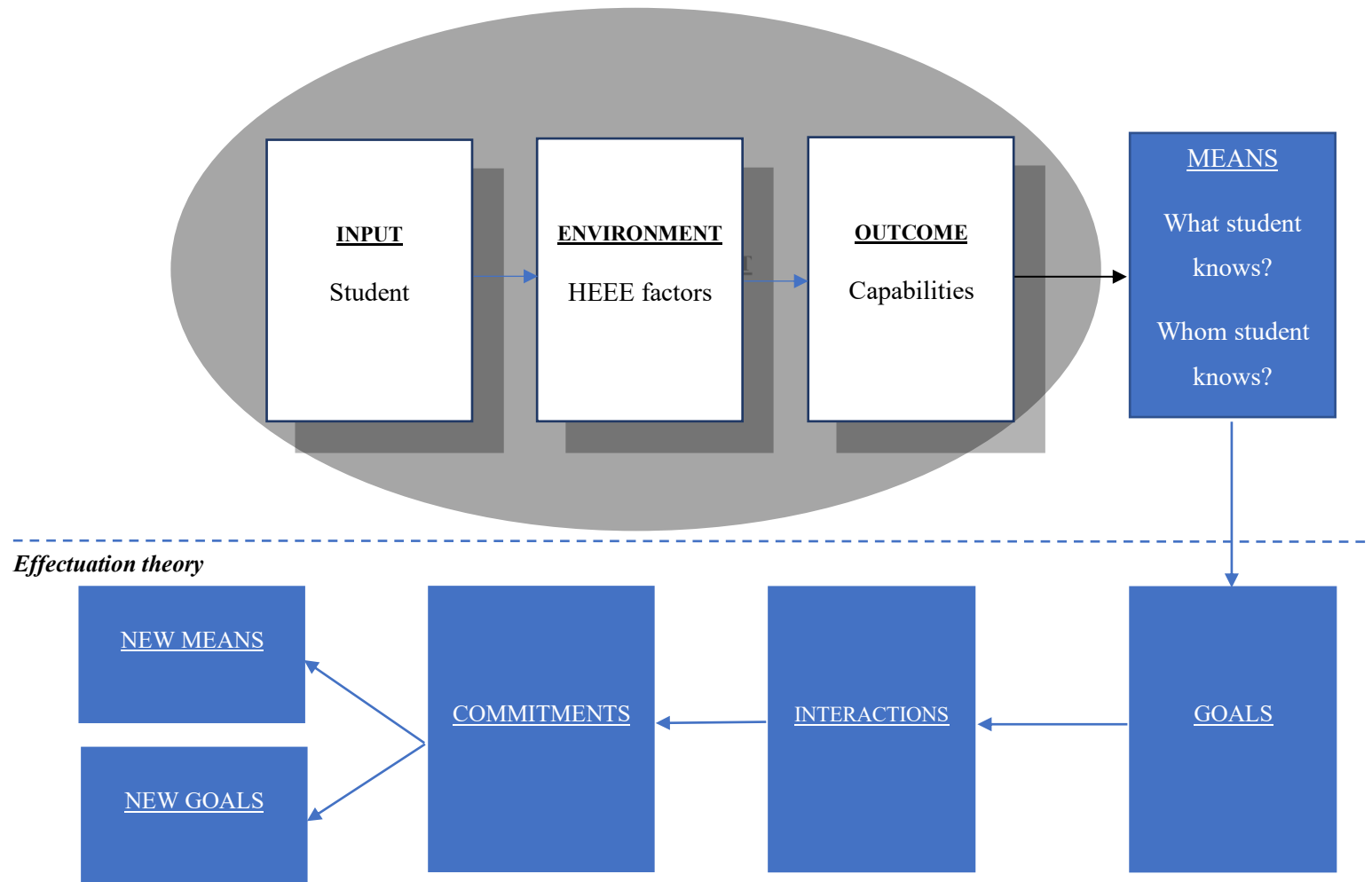


Figure 4.5 – Framing effectuation theory to this research

Sourced and adapted from The Society for Effectual Action (2018)

4.7 Theoretical framework

The theoretical framework for this study is constructed using the natural order of theory building – that is, ‘input → process → output (Grégoire & Cherchem 2019) – and draws on the logics from four existing theories: systems theory, student involvement theory, social capital theory and effectuation theory. While student involvement theory serves as the central logic of this study, paying attention to student development within HEEEs, systems theory conceptualises the wider entrepreneurial ecosystem. Next, social capital theory focuses on the interactions and benefits to and from stakeholders within the HEEE, with particular emphasis on students. In this way, student involvement theory and social capital theory work together, demonstrating the underlying logic of stakeholder ties within HEEE composition. Using effectuation theory, the HEEE is extended, bridging the gap between the development process and the entrepreneurial process, where an individual with the available means may become a successful entrepreneur.

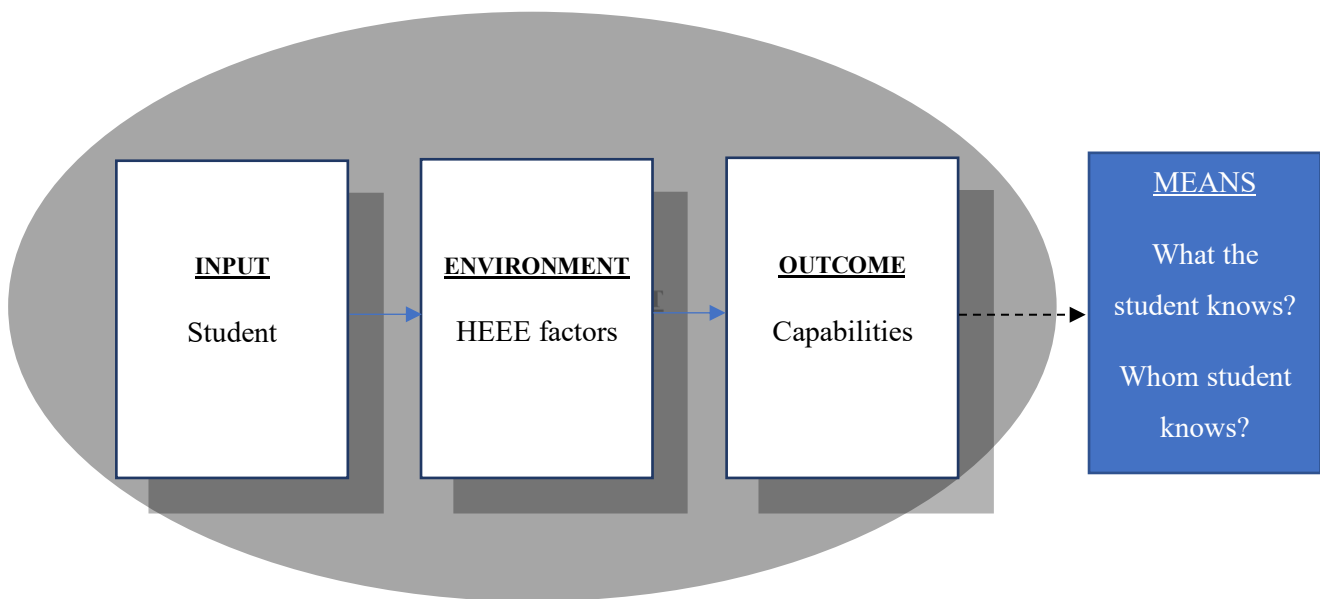


Figure 4.6 – Theoretical framework

4.8 Chapter summary

This chapter scaffolds the relevant theories this research is built on. The theoretical background of this research draws from three domains: entrepreneurial ecosystems; entrepreneurial universities and HEEEs. The four theories applied to the theoretical framework were selected based on its purpose for the research. The central theory, student involvement theory, accentuates how students change and develop as they participate in the higher education environment, in this case the HEEE, during their learning process. Next, systems theory highlights the environment HEEEs belong to and explains the association to the wider entrepreneurial ecosystem. Social capital theory emphasises stakeholder relationships and engagement that create benefits and opportunities for other stakeholders including students. Finally, the theory of effectuation explains the potential entrepreneur beginning the decision-making process towards entrepreneurship based on their available means. Collectively, these four theories provide the lenses for this study to explore the development of HEEEs, their composition and stakeholder engagement towards students' capability development.

CHAPTER 5: RESEARCH DESIGN

5.1 Chapter overview

This chapter aims to describe the design of this study. The organisation of the chapter in Figure 5.1 is adapted from the research framework by Creswell and Creswell (2018), which guides researchers to plan research. When designing this study, the following essential questions were answered: (1) What was done to achieve the research aim and objectives? (2) Why was a particular methodology chosen over others? (3) When was data collected and from whom? (4) What tools were used to collect data and why? (5) What tools were used to analyse data and why? (6) What ethical considerations were considered? How this study was carried out will be discussed below.

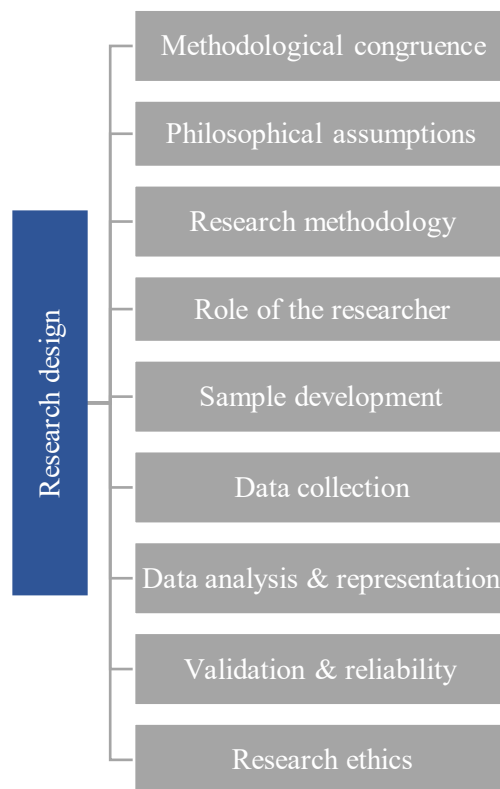


Figure 5.1 – Chapter 5 outline

5.2 Methodological congruence

Researchers tend to start with a research problem, examine related literature, pose research questions, gather and analyse data, and proceed to findings (Creswell & Poth 2018). This study was carried out in the same process. Within this process, there should be methodological congruence where the purpose, research questions and methods are interrelated, leading to a cohesive study (Morse & Richards 2002). Further, Maxwell (2013) advances an interactive approach to research design with the goal of creating coherent research. Therefore, the researcher was mindful of the interconnection of the different sections and began the research design by identifying the research problem that needs investigation, advancing the purpose of the study and specifying the research questions to be addressed (Creswell & Poth 2018).

This study explores the development and composition of HEEEs. Among previous studies, HEEEs are positioned an initiative by higher education institutions in their endeavour to become more entrepreneurial by generating student start-ups and fostering student entrepreneurial intention and mindset. This research investigates HEEEs for student entrepreneurial development including E&I capabilities in a resource-constrained environment. At a global level, countries are striving to increase the number of youths with relevant skills to pursue entrepreneurship in line with the United Nations SDGs. At a local level, Sri Lanka as a developing country is challenged by the high start-up failure rate associated with entrepreneur-related capabilities. The research aims to understand the composition, factors and actors of HEEEs for facilitating E&I capabilities in a resource-constrained environment, in order to provide actionable insights on designing learning environments at an institutional level.

Research questions explore how diverse stakeholders anticipate the continued development of HEEEs in a resource-constrained environment; what they perceive as the composition of HEEEs that could influence students' E&I capabilities in a resource-constrained environment, and how and why. The findings of this study intend to advance the theoretical understanding of HEEEs and benefit the management of higher education institutions, stakeholders of the wider entrepreneurial ecosystem, students, future entrepreneurs and entrepreneurship scholars. The above problem, purpose and questions lay the foundation for decisions related to the research design (Creswell & Poth 2018).

5.3 Theoretical orientation and interpretative framework

Higher education is driven by scientific research for its progress (Juhl & Buch 2019). Entrepreneurship and its investigated subfields of study including HEEEs is a social science concept (Urbano et al. 2019; Malecki 2018; Hoppe 2016; Audretsch et al. 2015; Karataş-Özkan et al. 2014; Etzkowitz 2013; Karataş-Özkan 2011). Scholars in social science view and investigate social phenomena shaped by philosophical assumptions (Grbich 2007). It is argued that philosophical assumptions go unsaid in research (Slife & Williams 1995). However, it is important to identify the use of abstract ideas and beliefs that represent the assumptions and explanations as this informs the practice of research (Creswell & Creswell 2018).

While philosophical assumptions are brought to the research as ‘worldviews’ by the researcher, theoretical orientations are found in the extant literature and taken to the research as a ‘theoretical lens’ (Creswell & Poth 2018). As a study, this research is a theoretically oriented project informed by theories in literature which were discussed in Chapter 4. The combination of four lenses – systems theory, student involvement theory, social capital theory and effectuation theory – provide foundations of inquiry to the study. When using existing theories in this research, framing theories can be understood as ‘a spotlight’ or ‘a coat closet’ (Maxwell 2013). In this study, the intention of illuminating what the researcher sees and shed light on the areas of interest demonstrates the metaphor ‘theory is a spotlight’ (Maxwell 2013). The use of social science theoretical lenses identifies that this study underpins a theoretical orientation which operates more at a practical level (Creswell & Poth 2018).

When adapting a theoretical orientation, there are paradigm interpretive frameworks including post-positivism, social constructivism, transformation and postmodernism that inform a qualitative study (Creswell & Poth 2018). In this study, reality is viewed as socially embedded and existing within the mind, where it is multiple and constantly changing (Grbich 2009). This study is cause-driven research investigating a real-world situation and problem relating to higher education institutions being responsible for contributing to sustainable development and economic recovery through entrepreneurship (Maritz et al. 2020; Giones et al. 2020; Liguori & Winkler 2020; Ratten & Jones 2020; Cander et al. 2020). Furthermore, these higher education institutions are expected to alleviate national challenges such as increasing youth employment through skill development (Dissanayake 2020; World Bank 2020; Department of Census and Statistics 2018; Ministry of Sustainable Development 2018; Senarath et al. 2017). The researcher seeks to understand the world in which the problem prevails and to develop knowledge and meaning jointly through interaction between the

researcher and the people who live and work within that space (Grbich 2009). This intent identifies the interpretive framework of this research as social constructivism with its ability to provide a deeper understanding of the concept studied by exploring and interpreting the lived experiences of the participants (Creswell & Poth 2018). A social constructivism paradigm involves pluralistic, open-ended, interpretative and contextualised viewpoints on reality (Creswell & Miller 2000). The philosophical assumptions of social constructivism are summarised in Table 5.1 to outline the nature of reality, how reality is known, the role of the researcher and the approach to inquiry.

Table 5.1 – Interpretative framework with associated philosophical beliefs

Interpretative framework	Ontological beliefs	Epistemological beliefs	Axiological beliefs	Methodological beliefs
Social constructivism	Multiple realities are created through the lived experiences and interactions with others	Reality is created between the researcher and the participants shaped by individual experiences	Researcher’s role and values are acknowledged and honoured	Qualitative inquiry using methods such as interviews, and observing and analysing texts

Source – Creswell and Poth (2018, p. 35)

Social constructivism is an interpretative framework that shapes how the researcher views the problem and interprets the data (Creswell & Poth 2018). Reality is constructed through individual perceptions and experiences shared between the researcher and the participants of the study and contributing to multiple realities (Creswell & Creswell 2018). For instance, when addressing the second research question, the researcher seeks the complexity of views related to contextual factors rather than narrowing the meanings into a few factors that influence student entrepreneurial development. When seeking answers for the research questions, the researcher relies as much as possible on participants’ views of the situation (Creswell & Poth 2018). The outcome of knowledge is considered a social product that is subjective and constructed based on the shared culture of the researcher and participants (Grbich 2009).

5.4 Research approach and methodology

Scholarly work in entrepreneurship represents predominantly qualitative and quantitative research (Landström et al. 2012). When conducting research, there seem to be concerns that researchers compromise and opt for convenience and quick turnaround rather than well-

designed research to develop knowledge that is academically and empirically cumulative or practical and applicable (Miller 2011). Through the review of scholarly work on HEEEs (refer Table 5.2), it is evident that HEEEs have been predominately investigated using either qualitative or quantitative inquiry.

Table 5.2 – Research design of prior HEEE studies

Scholars	Theory	Research design	Context	Focus
Longva (2021)	Social network theory	Qualitative inquiry In-depth interviews	Norway	Start-ups
Webber, Kitagawa & Plumridge (2020)	Theory of planned behaviour	Mixed research Online survey Public databases Institutional documentation	UK	Entrepreneurial intention
Guerrero, Urbano & Gajón (2020)	Utility-maximising function	Quantitative inquiry Survey	Mexico	Entrepreneurial intention
Meyer et al. (2020)	Stakeholders	Quantitative inquiry Survey	US, South Korea and India	Start-ups
Shil et al. (2020)	Triple helix	Qualitative inquiry Focus group discussions	Bangladesh	Start-ups
Secundo et al. (2020)	Quadruple helix	Mixed research Case study Observations, documents, interviews and survey	Italy	Entrepreneurial mindset
Allahar & Sookram (2019)	Triple helix	Qualitative inquiry Case studies Secondary data	Caribbean	Start-ups
Wright, Siegel & Mustar (2017)	n/a	n/a	Multiple countries	Start-ups
Miller & Acs (2017)	Turner’s frontier thesis	Qualitative inquiry Case study Interviews, observations, documents and media	US	Start-ups
Rice, Fetters & Greene (2014)	Resource-based view	Case study Interviews and secondary data	US	Start-ups

This study is exploratory in nature, inquiring with ‘how’ questions focused on the development of HEEEs, specifically on their composition and stakeholder engagement. Qualitative research is suggested as most appropriate when a research problem needs to be explored (Creswell & Creswell 2018). For this research, exploration is crucial to arrive at the

continued development of HEEEs as a part of the entrepreneurial ecosystem, the contextual factors through the perceptions of diverse stakeholders of the entrepreneurial ecosystem, and the opportunities for stakeholder engagement within an HEEE. Using qualitative research, researchers can conduct a complex and deeper exploration of a problem and concept (Creswell & Poth 2018). The breadth and depth of this understanding can only be established by investigating relevant stakeholders directly and giving them the opportunity to share their experiences through qualitative study (Creswell & Poth 2018). In recent times, scholars have begun to widely accept qualitative research by producing more studies using qualitative approaches and generating new theories shaping the understanding of theoretical knowledge (Gehman et al. 2018).

When aiming for a complex study, researchers may recognise an approach to the qualitative inquiry from five qualitative approaches: narrative research, phenomenological research, grounded theory, ethnographic research and case study research (Creswell & Creswell 2018; Tracy 2010). This study exploring HEEEs for student entrepreneurial development draws on psychology and education disciplines. The central theory of the study, student involvement theory, is based on students' psychology and developmental influences during their higher education journey. Further, the research focus revolves around understanding the essence of the HEEE and the research problem involves describing the essence of a lived HEEE experience by diverse stakeholders with a student perspective. Therefore, the qualitative approach that best fits this research type and needs is phenomenological research (Creswell & Poth 2018).

Entrepreneurship scholars suggest that phenomenological studies are useful in contributing to the theoretical development of concepts through new insights and practical occurrences (Ratten & Miragaia 2019). Further, Pret, Shaw and Dodd (2016) emphasise that research with a phenomenological approach enables scholars to enhance existing knowledge by suggesting new research avenues. Given that entrepreneurship and their sub-fields including entrepreneurship education and HEEEs are in developing stages, entrepreneurship scholars such as Ratten and Miragaia (2019) and Thrane et al. (2016) have taken and recommend a phenomenological approach in this field.

The phenomenological approach includes a strong philosophical component and involves exploring and understanding the rich meaning of a concept held by a group of individuals through their lived experiences leading to a universal essence (Creswell & Creswell

2018). Description of this essence of the experience of the concept becomes the phenomenology and several approaches to phenomenology (transcendental phenomenology, existential phenomenology and hermeneutical phenomenology) are highlighted in the literature (Creswell & Poth 2018). This study involves research that begins with a theory, and this approach refers to hermeneutical phenomenology (Creswell & Poth 2018). In hermeneutical phenomenology, research is based on theory and uses the interpretation of participants' experiences and perspectives (Grbich 2009). Therefore, this study undertakes a combination of a deductive approach that is theory driven and an inductive approach that is data driven (Creswell 2013). Table 5.3 summarises the considerations of the phenomenological approach that justify its applicability for this research and directs upcoming research design decisions.

Table 5.3 – Considerations of phenomenological approach

Qualitative approach	Nature of disciplinary origins	Research focus	Unit of analysis	Data collection and analysis
Phenomenological approach	Philosophy, psychology and education	Understanding the essence of the experience	Studying several individuals who have shared the experience	Interviews with individuals and analysing data for significant themes

Source – Creswell and Poth (2018, p. 104)

5.5 Role of the researcher

In qualitative research, the researcher is considered important. In social constructivism, the researcher and their background are recognised as they are involved in interpreting participant perceptions and experiences of the world (Creswell & Poth 2018). As individual values of the researcher are honoured in social constructivism, Saunders et al. (2018) suggest a statement of values to position the researcher. Consequently, I present my statement of personal values that underpins this study.

“Over the last 14 years, I have been an academic by profession and passion. Because of my penchant for the students’ growth through higher education, I explored a new area of study while marketing has been my forte. Staying true to my values, I am committed to supporting students to have a positive transformation by receiving the relevant higher education experience to pursue their preferred careers. As a researcher, I intend to contribute to knowledge and advance the understanding of higher education

entrepreneurial ecosystems, for the benefit of higher education institutions which can ensure in an economic and social impact. I undertake this PhD journey to advance my academic career and as a personal achievement.”

Further, Kuratko (2005, p. 592) stated “entrepreneurial history will judge you, and as the years pass, you will judge yourself, on the extent to which you have used your abilities to pioneer and lead our universities into a new horizon. In your hands is the future of your entrepreneurial world and the fulfillment of the best qualities of your own spirit.” Guided by the advice of Kuratko, this is the extra-textual frame of this study which demonstrates the knowledge the researcher has obtained and through which the world is viewed (Grbich 2009; McLachlan & Reid 1994). In my position as the researcher, I intend to leverage my experience to advocate for greater responsible management in the higher education industry. This study is a timely, relevant initiative, and collectively the work aims to advance higher education institutions and scholarships.

5.6 Sample selection

5.6.1 Population and participants

Studies involving ecosystems raise the question of what the most suitable unit of analysis is: the country, a state, a city or something like an incubator (Miller & Acs 2017). When deciding on the unit of analysis, the research aim and questions need to be considered (Saunders et al. 2018). This study is centred on ecosystems of higher education institutions (HEEEs). Feters, Greene and Rice (2010) refer to an HEEE as a multi-stakeholder environment and emerging definitions identify HEEEs as a set of interconnected groups of actors committed to entrepreneurship (Bock et al. 2020; Rice, Feters & Greene 2014). As a study underlining a phenomenological approach, it is most suitable for the research to involve studying a group of heterogeneous individuals who have shared experience (Creswell & Poth 2018).

Literature echoes those stakeholders that form the entrepreneurial community within its environment and enable higher education institutions to recognise their group of interconnected individuals and organisations when co-creating an HEEE (Brush et al. 2017). Scholars distinguish HEEEs as a complex system of collaborative links between salient stakeholders and have posited it as important to include these stakeholders as key informants when engaging in research on facilitating entrepreneurship through higher educational institutions (Belitski & Heron 2017). All stakeholders should be involved in entrepreneurial activities of successful HEEEs and should be invited to develop the HEEE community (Greene,

Mole & Storey 2004; O'Brien, Cooney & Blenker 2019). Lived experiences of diverse stakeholders relating to entrepreneurship education influence students towards entrepreneurship and beyond within the ecosystem (Fetters, Greene & Rice 2010).

However, the central theory framing this study is student centric. HEEE studies have included students (Longva 2021; Secundo et al. 2020; Webber, Kitagawa & Plumridge 2020) and even been based only on student perspectives (Guerrero, Urbano & Gajón 2020). Using students as the unit of analysis is criticised to some extent in the literature due to the lack of external validity (Mortensen et al. 2012). Some scholars argue that students lack real-world experiences hence their responses might not make the best data (Peterson 2001). Due to this view, alumni entrepreneurs who were students of participating higher education institutions were included in this study. These alumni entrepreneurs experienced HEEEs and are now active within the broader entrepreneurial ecosystem. Their perspectives are considered as stronger reflections of the past experience compared to current students who are criticised for their lack of external validity. While alumni entrepreneurs may not be current students, their views are of the HEEE at a given point in time include reflections of the reality of the HEEE at the time of completion. Therefore, it is rational to explore HEEEs through a group of diverse stakeholders who have experienced and observed the concept and can relate to the student experience. The system of an entrepreneurial ecosystem, of which higher education institutions are a part, refers to diverse stakeholders as the participants for this research.

Higher education institutions represent the key domain of 'human capital' as institutions offering academic degrees or entrepreneurship training in an entrepreneurial ecosystem (Isenberg 2010). In this case, the population consists of higher education institutions and their HEEEs in Colombo, Sri Lanka. These higher education institutions are privately owned companies offering undergraduate study programs affiliated with international universities. When exploring HEEEs in a resource-constrained environment, the most relevant stakeholders to the context are recognised as deans/heads of schools, academics/educators, alumni entrepreneurs, established entrepreneurs, angel investors and support professionals (refer Table 5.4). These stakeholders are involved in the design and delivery of HEEEs.

Deans/heads of schools and academics/educators of higher education institutions can be categorised as internal stakeholders. External stakeholders include alumni entrepreneurs, established entrepreneurs, angel investors and support professionals. These internal and external stakeholders represent the domains of human capital, markets, finance and support in

an entrepreneurial ecosystem (Isenberg 2010). Stakeholders for the ‘policy’ domain are intentionally not investigated in this research as the government in Sri Lanka plays a minimal role in private higher education institutions, where such institutions operate as private businesses collaborating with foreign universities to offer higher education through accredited study programs.

Table 5.4 – Participants of this research

Type of stakeholder	Domain of entrepreneurship ecosystem	Stakeholder group	Rationale for stakeholder selection
Internal stakeholders	Human capital (educational institutions)	Deans/heads of schools	Deans and heads of school in leadership positions managing schools of study and taking decisions on the respective HEEEs
		Academics / educators	Academics/educators teaching entrepreneurship or related units within the undergraduate degree and engaging with students within the various initiatives of the HEEE.
External stakeholders	Market (networks)	Alumni entrepreneurs	Undergraduates who have founded a start-up after their graduation and the start-up is less than 3.5 years old. These alumni entrepreneurs have experienced HEEEs within the last 3-4 years and hold stronger reflections of the HEEE experience as students.
		Established entrepreneurs	An entrepreneur with more than 3.5 years in profit-oriented business. Such entrepreneurs have engaged with HEEEs through various initiatives and support student entrepreneurs.
	Finance (financial capital)	Angel investors	Individuals who provide capital for a start-up in exchange for ownership equity or convertible debt. These investors have interest in young entrepreneurs and seek for new business ideas to invest in.
	Support (support professionals)	Support professionals	Individuals who are mentoring, coaching or providing support to young entrepreneurs. Such professionals interest in young entrepreneurs and extend their support voluntary.

5.6.2 Sample and sampling

The above section identifies the participants of this research as deans/heads of schools, academics/educators, alumni entrepreneurs, established entrepreneurs, angel investors and support professionals. A range of internal or external stakeholders has been investigated in previous HEEE studies (refer Table 5.5). Previous HEEE work by Rice, Fetters and Greene (2014) and Miller and Acs (2017) explored HEEEs through a combination of internal and external stakeholders. However, more recent studies on HEEEs by Webber, Kitagawa and Plumridge (2020) and Guerrero, Urbano and Gajón (2017) have given prominence to the

student population. Further, the focus of these previous studies is different to the newly explored student entrepreneurial development in this study. The sample for this study involves six salient stakeholders representing HEEEs and their entrepreneurial ecosystems.

Table 5.5 – Participants of prior HEEE studies

Scholars	Theory	Research design	Participants	Context
Longva (2021)	Social network theory	Qualitative inquiry In-depth interviews	15 student entrepreneurs, educators and support actors	Norway
Webber, Kitagawa & Plumridge (2020)	Theory of planned behaviour	Mixed research Online survey, public databases and institutional documents	1,210 students	UK
Guerrero, Urbano & Gajón (2020)	Douglas and Shepherd's utility-maximising function	Quantitative inquiry Survey	8,948 students	Mexico
Meyer et al. (2020)	Stakeholders	Quantitative inquiry Survey	Representatives from entrepreneurship centres of 5 universities	US, South Korea and India
Shil et al. (2020)	Triple helix	Qualitative inquiry Case study Focus group discussions	Faculty members and administrative officials of 1 university	Bangladesh
Secundo et al. (2020)	Quadruple helix	Mixed research Case study Observations, documents, interviews and survey	Professors, mentors, educators and students of 1 university	Italy
Allahar & Sookram (2019)	Triple helix	Qualitative inquiry Case studies Secondary data	2 universities	Caribbean
Wright, Siegel & Mustar (2017)	n/a	n/a	n/a	Multiple countries
Miller & Acs (2017)	Turner's frontier thesis	Case study Interviews, observation, documents and media content	32 internal and external stakeholders	US
Rice, Fetters & Greene (2014)	Resource-based view	Case study Interviews Secondary data (surveys, project data)	Internal and external stakeholders of 6 universities	US

The first two stakeholder groups are deans/heads and academics/educators attached to private higher education institutions in Colombo, Sri Lanka. According to Walter et al. (2011), stratified sampling is effective for studies focused on entrepreneurship education in which the researcher may first identify the higher education institutions. To ensure high quality and representativeness, a stratified random sample of nine private higher education institutions was drawn and is shown in Table 5.6. The strata were set as private higher education institutions:

(1) offering an undergraduate in entrepreneurship or teaching entrepreneurship within undergraduate degrees of other disciplines; (2) offering three or more fields of study; and (3) located in Colombo, Sri Lanka.

Table 5.6 – Sample of private higher education institutions

Institution	Element of entrepreneurship	Departments / Fields of study
Institution A	Entrepreneurship modules	Business, computing and law
Institution B	Entrepreneurship taught within modules	Business, computing and health
Institution C	Entrepreneurship degree	Business, computing, hospitality and psychology
Institution D	Entrepreneurship taught within modules	Business, computing and law
Institution E	Entrepreneurship modules	Business, computing and education
Institution F	Entrepreneurship taught within modules	Business, computing, engineering and science
Institution G	Entrepreneurship taught within modules	Business, engineering and law
Institution H	Entrepreneurship modules	Architecture, business, computing, engineering, humanities and science, law, hospitality and culinary
Institution I	Entrepreneurship taught within modules	Business, computing, engineering and science

The rest of the four stakeholder groups are individuals from start-ups, business ventures or organisations including alumni entrepreneurs, established entrepreneurs, angel investors and support professionals. Purposive sampling is commonly used for studies in the field of entrepreneurship including by Lahikainen et al. (2019), Theodoraki et al. (2018) and Krueger et al. (2000). For this group, stakeholders were drawn using purposive sampling (Saunders et al. 2018) by selecting key informants with interest in student entrepreneurs, higher education and HEEEs. This purposeful selection of participants was based on their interests and characteristics that can contribute to the research problem and study (Creswell 2007). Although this sampling technique is argued to be researcher biased, purposive sampling was deemed suitable as the selection was based on clear criteria of stakeholder groups identified in Table 5.4 (Ranga et al. 2016; Small 2009; Marshall 1996).

With reference to the sample size, there is no specific number suitable for qualitative research. However, the number of participants can be decided based on the nature of the population. If the research population is of a homogeneous nature, six to eight interviews are adequate and if the population is more heterogeneous then 12 to 20 is acceptable (Saunders &

Townsend 2016). Further, in general, 20 to 30 individuals are considered acceptable for a qualitative study (Creswell & Creswell 2018). A key work on HEEEs by Miller and Acs (2017) based on the University of Chicago interviewed 32 individuals who had an interest and were pivotal in start-ups created by students at US colleges. Therefore, it was deemed suitable for qualitative data collection to engage 30 to 40 participants given the heterogeneous population of the study. As an approximation, it was initially planned to complete interviews with 36 stakeholders with an equal representation of six participants per stakeholder group. It was understood that only some higher education institutions would be willing to participate in this study. Thus, the study sought input from six deans/heads and six academics/educators from participating higher education institutions, six alumni entrepreneurs, six established entrepreneurs, six angel investors and six support professionals. During data collection, the sample increased to ten alumni entrepreneurs resulting in 40 interviews. Scholars suggest continuing data collection until saturation where there are no new ideas, themes or findings (Francis et al. 2010) and the same applies for this study.

5.7 Data collection

5.7.1 Research instrument

As qualitative research, the study calls for gathering consensus through methods such as interviewing, observing and analysing texts (Creswell & Poth 2018). However, as research with a phenomenological approach, data collection involves in-depth interviews with diverse individuals who have experienced the concept (Grbich 2009). Compared to observations and secondary records, interviews are social interactions between the researcher and participant where knowledge is constructed (Creswell & Creswell 2008). HEEE studies discussed in the literature review including work by Longva (2021), Secundo et al. (2020), Miller and Acs (2017) and Rice, Feters and Greene (2014) have used interviews as the tool for qualitative data collection. Specifically, the University of Chicago study employed semi-structured interviews among individuals involved in creating student start-ups at US colleges (Miller & Acs 2017). As an exploratory study, semi-structured interviews are suggested as the best fit (Saunders et al. 2018) where interviews are an attempt to understand the world from the participant viewpoint to explore the meaning of their experiences (Freeman et al. 2007). Therefore, semi-structured interviews were selected as the instrument for this study.

As exploratory research, the interview questions were designed as an open inquiry allowing for free discussion during data collection (Creswell & Creswell 2018). The interview

protocol was designed according to the research questions of the study (Creswell & Poth 2018). Each research question aimed to explore the key concepts and ask questions in a simple manner that participants could understand. This design protocol (refer Figure 5.7) allowed the researcher to gather participants' perspectives on HEEEs that addressed the research aim and questions. Therefore, the interview protocol was developed in four sections:

Section A: Participant and start-up/organisation demographics

Section B: Continued development of HEEEs

Section C: HEEE factors

Section D: Stakeholder engagement

The interview protocol was designed in a structured format with four sections: basic information about the interview, an introduction of the interviewer and research, a series of questions, and closing instructions (Creswell & Creswell 2018). As data collection invited participation from a diverse range of stakeholders, two sets of interview protocols (refer Appendix A1 and A2) were designed to best suit; (1) deans/heads of school and academics/educators from higher education institutions; and (2) alumni entrepreneurs, established entrepreneurs, angel investors and support professionals from the entrepreneurial ecosystem. During any given interview, the order of questions and flow differed according to the participant and direction of the conversation.

In such interviews, the total number of questions should range between five and ten, which are prepared in advance and used consistency during interviews (Creswell & Creswell 2018). The interview protocol for this research encompassed three categories of interview questions: opening questions, content questions and closing questions.

Table 5.7 – Design of interview protocol

Focus and research questions	Explored concepts	Interview protocol	Section
Higher education entrepreneurial ecosystems	Domain and role	Personal and start-up/organisation demographics	Section A
How do diverse stakeholders anticipate the continued development of HEEEs in a resource-constrained environment?	HEEE and link to entrepreneurial ecosystem	Development of HEEEs and contribution to wider entrepreneurial ecosystem	Section B
What do diverse stakeholders perceive as the composition of HEEEs that could influence students' E&I capabilities in a resource-constrained environment? How and why do specific contextual factors of HEEEs influence students' E&I capabilities in a resource-constrained environment?	HEEE factors aligned to entrepreneurship education and entrepreneurial support	Activities currently conducted within HEEEs and suggested initiatives for the future	Section C
How can diverse stakeholders engage within the factors of HEEEs that could influence students' E&I capabilities in a resource-constrained environment?	Stakeholders within HEEEs and outside from the wider entrepreneurial ecosystem	Stakeholders presently involved in HEEEs and opportunities for better engagement	Section D

5.7.2 Participant recruitment

Data collection for this study was conducted in two phases. Recruitment of participants for this study began in September 2020 and data collection continued until November 2020. Participant recruitment was also conducted in two phases: (1) participants within higher education institutions; and (2) participants outside in the wider entrepreneurial ecosystem. At first, the expected number of participants was 36 stakeholders, however, there was a high level of interest from the invited participants. After the first round of theory-driven analysis, a follow-up round of interviews was held between August and September 2021 in search of deeper understanding. This second round of interviews recruited new participants, bringing the total to 40 participants; the breakdown of participants is shown in Table 5.8. A higher number of alumni entrepreneurs participated in the study compared to the other stakeholder groups. There were no withdrawals from any participant after accepting the invitation to participate or completing the interview.

Table 5.8 – Participant representation for this study

Stakeholder category	Domain of entrepreneurial ecosystem	Stakeholder group	Description / Criteria	Number of recruited interviewees
Internal stakeholders	Human capital	Dean / Head of school	Deans and heads of school in leadership positions managing schools of study	6
		Academic / Educator	Academics/educators teaching entrepreneurship or related units within the undergraduate degree	6
External stakeholders		Alumni entrepreneur	Graduates who have founded a start-up after their graduation and the start-up is less than 3.5 years old	10
		Established entrepreneur	An entrepreneur with a profit-oriented business more than 3.5 years old	6
	Finance	Angel investor	Individuals who provide capital for a start-up in exchange for ownership equity or convertible debt	6
	Support	Support professional	Individuals who are mentoring, coaching or providing support to young entrepreneurs	6

First, the email addresses of the higher education institution sample were extracted from their respective institution websites and the deans/heads of school were contacted via email. The introductory email for the purpose of participant recruitment (refer to Appendix A6) was sent to the identified deans/heads outlining the purpose of the study in brief and inviting them to participate, as suggested by Saunders et al. (2018). This email also included the participant information statement as an attachment (refer to Appendix A3) explaining the research project, its rationale, interests, risks and benefits, consent, privacy and confidentiality, research output and contact information. If the invitee responded communicating their willingness to participate in the research, consent was requested from the participant. Two consent forms were used in the case of higher education institutions, one for authorising employees to be filled by deans/heads when nominating staff, and the other for individual adults by deans/heads and academics/educators (refer to Appendix A4 and A5).

Three out of nine deans/heads declined the invitation, and six deans/heads from higher education institutions accepted the invitation to participate in the study (refer Table 5.9). In addition to the deans/heads who participated, they nominated two or three potential

academics/educators who were suitable for the study and these academics/educators were contacted separately in the listed order. In all cases, the first contacted academic/educator was willing to participate in the study.

Table 5.9 – Participation of private higher education institutions

Institution	Entrepreneurship education	Response to research invitation
Institution A	Entrepreneurship modules	Accepted
Institution B	Entrepreneurship taught within modules	Declined
Institution C	Entrepreneurship degree	Declined
Institution D	Entrepreneurship taught within modules	Accepted
Institution E	Entrepreneurship modules	Declined
Institution F	Entrepreneurship taught within modules	Accepted
Institution G	Entrepreneurship taught within modules	Accepted
Institution H	Entrepreneurship modules	Accepted
Institution I	Entrepreneurship taught within modules	Accepted

Second, the remaining participants, including alumni entrepreneurs, established entrepreneurs, angel investors and professionals, were identified and contacted via LinkedIn. The researcher identified the suitable participants by scanning their posts for involvement in HEEE-related activities and who might be able to share their perceptions/experiences related to the research. The identified participant was sent a brief message regarding the research and if they responded with a willingness to participate then communication was continued via email. The majority of the contacted participants were willing to participate and approximately one participant per stakeholder group did not respond to the LinkedIn message. Similar to the deans/heads and academics/educators, these participants were also forwarded the participant recruitment email with the participant information sheet. As they communicated their interest to participate in the study, their consent was requested in the same email using the consent form for individuals. To schedule the interview, a calendar invite was sent to all participants along with a Zoom meeting link, making it easier for the participant to calendarise the interview within their schedule.

5.7.3 Interview procedure

Interviews are purposeful discussions between the researcher and the participant built around the area of research to gather data relevant to the study (Saunders et al. 2018). The procedure

for preparing and conducting interviews as suggested by Creswell and Poth (2018) was used for this qualitative data collection. Each one-to-one interview was planned for a duration of approximately 30 to 45 minutes, depending on the availability and willingness of the interviewee. For comparison, a study exploring entrepreneurial universities conducted interviews with a 20- to 60-minute duration with students, faculty and management of a Finnish entrepreneurial university (Lahikainen et al. 2019). Consent was confirmed prior to starting each interview and interviews took between 30 and 60 minutes. Each interview was completed within the scheduled appointment and did not face disruptions or require re-scheduling. The interviews could not take place in the natural setting of the institution, start-up or organisation due to COVID-19 pandemic restrictions and as all participants were working from home. As an adequate recording procedure, all interviews were electronically recorded via Zoom with the consent of the participant (Creswell & Poth 2018).

5.8 Data analysis and representation

5.8.1 Data analysis plan

Research studies following the phenomenological approach, such as this study, are based on a theory and use the interpretations of participants to arrive at meanings about a concept (Grbich 2009). Interview data from this study presents lived experiences of participants describing an external reality (Silverman 2022) and this type of data is commonly analysed using content or thematic analysis to identify, analyse and report patterns (Braun & Clarke 2006). Both analytical techniques are applied in entrepreneurship literature according to the purposes served. While a thematic analysis facilitates an interpretative perspective of the data and creation of themes in a theoretical sense, a content analysis can further display data in frequency counts per category of content (Pistrang & Barker 2012; Bichoff, Volkmann & Audretsch 2017). The strength of content analysis is quantifying the themes to reach a consensus among the participants' responses to offer a better description of the findings (Saldaña 2021). As quantifying makes qualitative data more credible, a content analysis was applied in this study, similar to other studies (Grégoire & Cherchem 2018; Theodoraki, Messeghem & Rice 2018; Reyes 2016; Hannon, Collins & Smith 2005). To maintain the richness of the interview data, a set of relevant themes was first identified for each research question in this study before quantifying themes, where necessary (Frank & Landström 2016).

This study with its phenomenological approach was analysed using a combination of theory-driven and data-driven approaches (Creswell 2013). At the beginning of the study, a

theoretical background was established and an a priori framework developed using literature. The first step of analysis took a theory-driven approach using the initial dataset to ensure the validity of the study by establishing that theories and concepts represented the key interest of the study (Whittemore et al. 2001). For this deductive approach, this study utilised a list of codes pre-defined according to the research questions, theories and concepts that emerged from the literature review (Creswell & Poth 2018). Table 5.10 outlines the concepts and their attributes used for coding the themes pre-determined from literature.

Table 5.10 – Concepts and attributes for coding

Concept	Attributes
Development of HEEEs	Student start-ups, entrepreneurial mindset, entrepreneurial intention and entrepreneurial ecosystem
Composition of HEEEs	Entrepreneurial education and entrepreneurial support
Stakeholders of HEEEs	Internal stakeholders and external stakeholders

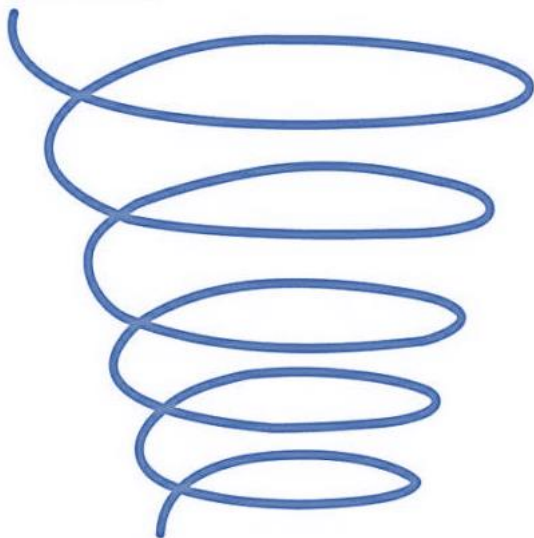
The next stage of data analysis involved generating themes from the analysis of significant statements or excerpts that provide an understanding of how the participants experienced the concept (Creswell & Poth 2018). These themes represent clusters of meaning that led to developing textual and structural descriptions (Creswell & Poth 2018). This analysis involves an inductive approach using a bottom-up technique and building themes from the data (Creswell & Creswell 2018). Within the social constructivism and hermeneutical phenomenology approaches, the ‘making sense’ process is used for identifying patterns and themes that lead to insights shaping the concept of interest (Creswell & Creswell 2018; Gehman et al. 2018; Tracy 2010). The sensemaking process includes three steps: (1) creation – identify cues and patterns; (2) interpretation – make sense of lived experiences; and (3) enactment – to recreate the story (Sutton & Staw 1995). Within this study, creation is evident in the three empirical chapters of findings, and interpretation and enactment is presented in the discussion chapter. More information on data analysis is discussed in Section 5.8.2.

5.8.2 Data analysis process

A qualitative researcher enters the data analysis process with a large amount of raw data and intends to exit with an account of findings (Creswell & Poth 2018). Once data is collected or during data collection, findings are custom-built or, rather, choreographed by the researcher using analytic procedures in the field (Huberman & Miles 1994). For this study, the data

analysis spiral was followed, where the researcher applied certain analytic strategies at each spiral to arrive at specific analytic outcomes (Creswell & Poth 2018). The five step data analysis spiral process is similar to the data analysis process out by Braun and Clarke (2006, p. 35), including the steps of “familiarising yourself with your data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report”. Although this analysis process was originally used in psychology research, scholars have previously applied it to studies related to entrepreneurship (Ratten & Miragaia 2020), entrepreneurship education (Donald et al. 2018; Pittaway & Cope 2007) and HEEEs (Allahar & Sookram 2019). The data analysis spiral used in this study is presented in Figure 5.2.

Data collection



Managing and organising the data

- *Mode of analysis, files & units and storage of files*

Reading and memoing emergent ideas

- *Note taking and reflective thinking*

Describing and classifying codes into themes

- *Initial codes, apply codes and aggregate themes*

Developing and accessing interpretations

- *Relate themes to literature*

Representing and visualising the data

- *Text, tables or figures*

Account of findings

Figure 5.2 – Data analysis spiral

Source – Creswell and Poth (2018)

5.8.3 Data management

At the beginning of the analysis process, all 40 interviews were transcribed verbatim (word for word) using Otter.ai. This helped to organise the data and create digital files where each interview transcript ranged between five and ten pages of transcription. Once the interview transcripts were ready, the data was input to the software NVivo for content analysis. Next, a project was created and stored on NVivo preparing a file for data management. Scholars commonly use NVivo to facilitate the content analysis of interview data as the software offers

transparency, flexibility, data coding and data retrieval (Corbin & Strauss 2015). Therefore, the data management software was selected based on the pre-decided analysis procedure.

The project in NVivo followed a case naming system, where each transcription was created as a case with an identifiable code. For instance, a transcription of a dean/head of school was named using the identifier DH with a number to represent participant and the first case was identified as DH1. This naming system was followed for all 40 cases of the research as shown in Table 5.11.

Table 5.11 – Case naming system for data management

Stakeholder group	Participant code	Description
Dean / Head of school	DH1 to DH6	Deans and heads of school in leadership positions managing schools of study
Academic / Educator	AC1 to AC6	Academics/educators teaching entrepreneurship or related units within the undergraduate degree
Alumni entrepreneur	AE1 to AE10	Graduates who have founded a start-up after their graduation and the start-up is less than 3.5 years old
Established entrepreneur	EE1 to EE6	An entrepreneur with a profit-oriented business more than 3.5 years old
Angel investor	AI1 to AI6	Individuals who provide capital for a start-up in exchange for ownership equity or convertible debt
Support professional	SP1 to SP6	Individuals who are mentoring, coaching or providing support to young entrepreneurs

5.8.4 Memoing

After creating cases in the project, the researcher continued to get a sense of the qualitative data (Creswell & Poth 2018). During this second spiral (refer Figure 5.2), each transcript was read twice, the first time to improve the readability of the content as software-generated transcriptions tend to have inaccuracies due to pronunciation differences by participants with English as their second language. Reading the full transcription, a second time helped make sense of the participant perspectives before breaking down the interview into parts (Creswell & Poth 2018). The second reading took longer as the researcher spent time putting down reflection notes in the form of a memo for each case/transcription. Memoing is a way of recording the researcher's ideas, insights and interpretations of the case, created separately on NVivo yet linked to the case, which is a transcription of a participant (McNeil 2021). This step

helped to organise the data and resulted in an audit trail that can be retrieved when needed, which also acts as a validation strategy (Creswell & Poth 2018).

5.8.5 Codes and themes

After becoming familiar with the dataset, the third spiral involved describing, classifying and interpreting the data (Creswell & Poth 2018). To start coding, the data were identified and labelled according to the initial codes pre-defined, as the theory-driven approach was formed by categorising small sections of data that prevailed relevant to the analysis and labelling the core ideas. When creating the second set of codes, the researcher inquired about the statements appropriate for the relevant research question. However, because of winnowing the data, not all data of a qualitative study is used, and some data was discarded (Creswell & Poth 2018).

Next, the researcher proceeded to ‘lean coding’ where data was reviewed to identify expanded codes which led from the first coding. Regardless of the project size, a final code list of 25 to 30 codes is suggested for a research project, leading to five or six aggregated themes (Creswell & Poth 2018). At the end of this spiral, a list of codes was finalised along with their descriptions, which set boundaries for each code (inclusion and exclusion criteria), resulting in a codebook for the project (Creswell & Poth 2018).

5.8.6 Researcher’s interpretations

As a qualitative study with a social constructivism framework, the researcher acknowledges that she interpreted the gathered data, and this interpretation flows from her own personal, cultural and historical experiences (Creswell & Creswell 2018). For this reason, the researcher’s reflexivity was established earlier in this chapter to understand her experiences and background (refer Section 5.4). Through the data analysis, the intention is to interpret and analyse the meaning that participants have about HEEEs as part of their world (Creswell & Poth 2018). This ‘sense-making’ requires the researcher to be critical and creative when considering the categories, patterns and themes generated by the analysis (Creswell & Poth 2018). Therefore, interpreting qualitative data involved conceptualising beyond the codes and themes to establish a larger meaning for the data. In doing this, the researcher turned to existing literature and models linking her interpretations to research previously developed by scholars (Creswell & Poth 2018). Further, initial conceptualisations for the research questions were presented to the research supervisors and subject experts to obtain feedback on whether interpretations were rational (Creswell & Poth 2018).

5.8.7 Data representation

Analysing data and concluding the interviews was an iterative and non-linear process for almost two years. In the final spiral, the researcher presents the findings from the study in the form of text, tables or figures (Creswell & Poth 2018). The representation of data was decided based on the nature of the research question addressed. The sought outcomes are the explanatory concepts and models where uniqueness is preferred and wide generalisation is avoided (Grbich 2009). The three research questions were answered with text and figures/tables. The text shows the multiple perspectives in the form of the researcher's interpretations supported with relevant excerpts from the interviews. For instance, in reporting contextual factors for the second research question, the researcher used the block-and-file approach to segment excerpts into columns with headings and present data as a table instead of separate entries (Grbich 2009). This text led to a qualitative visual of the findings through suitable data visualisation to broaden the understanding of findings (Henderson & Segal 2013). The visual aid demonstrated data more concretely through displayed patterns and possible comparisons visually represented that text cannot offer (Creswell & Poth 2018).

For all research questions, a distinct content analysis led to findings in the form of text and quantified themes. The data visualisations for each research question varied according to the nature and purpose of the question, and these visualisations displayed at theme level have moderate complexity. In research question one, a reorder matrix demonstrated the three outcomes found in participants' responses and displayed the level of importance for each outcome perceived by each participant. In this case, the reorder matrix listed the themes derived from the interviews and quantified them with the associated level of importance as perceived by the participants of the study (Henderson & Segal 2013). A spectrum display was used for the second research question to display qualitative data, as in Slone (2009). The spectrum displayed all six themes (i.e. contextual factors) and indicated whether each individual participant/case discusses the respective theme in their interview, which quantified the responses (Henderson & Segal 2013).

5.9 Validation and reliability

An ongoing academic debate is taking place on the validation and reliability of qualitative research (Creswell & Poth 2018). Among many perspectives on validation and reliability in qualitative research, this study holds the perspective that validation is an evolving process for assessing the accuracy of findings as best constructed by the researcher and participants

(Creswell & Poth 2018). This choice of perspective is based on the suggestion that in qualitative research with an interpretative approach such as this study, validation is a judgement of trustworthiness or goodness in the research (Augen 2000).

This perspective of validation and reliability was translated into strategies and techniques applied in this study as suggested by Augen (2000) and Creswell and Poth (2018). Augen (2000) suggested two types of validation for interpretive research; ethical validation and substantive validation. Ethical validation requires research to provide practical solutions to research problems with a generative promise. In doing so, this study found new understandings; raised new possibilities for HEEEs; opened new questions for entrepreneurship scholars and stimulated new dialogue through publication and presentation. This validation is of transformative value that may lead to action and change within higher education (Augen 2000).

Substantive validation refers to the researcher's understanding of the research topic, understanding from other sources and the documenting of this understanding in the study (Augen 2000). The compilation of interpretations was recorded in the thesis and publications for others such as the supervisors, panel, reviewers of this study and entrepreneurship scholars to determine the trustworthiness of meanings arrived at the end of the doctoral study. During the three years of this research, early chapters have been improved at three points with advanced understanding of the researcher's own topic. The findings for the research questions are intended to resonate with the audiences as compelling and convincing (Augen 2000). Through these strategies and techniques, ethical validation and substantive validation is achieved for this research.

A few more strategies and techniques for validation and reliability suggested by Creswell and Poth (2018) were followed. First, the researcher corroborated evidence from multiple stakeholder groups. Interviews gathered perceptions and experiences from six stakeholder groups representing the HEEEs and wider entrepreneurial ecosystem, with more than five participants per group (refer Sections 5.6). Second, the findings presented in chapters 6 to 9 establish multiple views of statements confirming and disconfirming prior literature. Third, to reduce researcher bias, the values and experiences that the researcher brought to the research are stated in Section 5.5 (researcher and reflexivity) and her interpretations in the research in Section 5.8.5 (researcher's interpretations).

Fourth, the researcher spent considerable time in the context of study prior to and during the study to familiarise herself with the context and participants (see Section 5.5). Fifth, for the purpose of auditing, the researcher captured the analysis through a digital audit trail via NVivo that enables examination of the process and the findings. Sixth, memos were created with rich, thick descriptions that helped during the analysis linked to the transcription (refer Section 5.8.3). Seventh, this research received reviews by internal supervisors and panel during the three years, while associated publications underwent external review by subject experts who were familiar with the concepts explored. From the nine procedures suggested for validation and reliability (Creswell & Poth 2018), a majority of seven have been observed in this research with validity lenses through the researcher, participant and reviewer.

5.10 Research ethics

Ethical considerations in research are paramount and a common misconception is that ethical issues surface only during data collection (Creswell & Creswell 2018). Research studies in Australia are regulated by the National Statement on Ethical Conduct in Human Research to ensure that the study is managed in adherence with legal, ethical and professional frameworks. For this study, ethics was anticipated through all stages of the qualitative study, from the beginning of the study to reporting and publishing the research findings (Creswell & Poth 2018).

5.10.1 Ethical considerations prior to study

To adhere to the National Statement on Ethical Conduct in Human Research, all ethical issues and considerations relating to the university were considered prior to commencing any data collection. Swinburne University facilitated the process of ethical scrutiny to create awareness of the relevant ethics issues and plans to mitigate them according to the type of study. In preparation, the draft ethics application for qualitative research was initially reviewed by both supervisors. Then, the improved application was reviewed by the research advisor of the School of Business, Law and Entrepreneurship, and developed prior to its submission. A well-reviewed human research ethics application including details of research team, administration, project details, data management plans and other additional documents was submitted to the Swinburne Ethics Committee for institutional review (Project ID 2915). Ethics approval for this study was granted in September 2020 and the study commenced following the completion of ethical review (refer Appendix B). This study was conducted according to the Swinburne

University Code of Ethics 2018, ensuring that the research was conducted responsibly and committed to specified guidelines, principles and relevant responsibilities.

5.10.2 Ethical considerations in preparing to investigate

At the beginning of the study, potential research participants were sent an invitation email as participant recruitment informing them of the purpose of the study. The participant information statement was also attached in this initial email for invited participants to access a comprehensive understanding of the research prior to accepting the invitation to participate. In both instances, it was clearly communicated that participation was voluntary. For instance, when deans/heads of school nominated two to three potential academics/educators suitable to participate in the study, they were contacted in the listed order and the invitation email for participant recruitment stated that participation was voluntary and there was no undue risk involved. This was to remove the possibility of any perceived coercion by being nominated by their managers, the deans/heads of the higher education institutions.

5.10.3 Ethical considerations in collecting data

If an invited participant did not respond to the first email invitation, they were not sent follow-up emails, as the study is voluntary. Only in the instance when the invited participant responded to the invitation with interest or willingness to participate was communication continued, including requesting for their consent. This was to avoid potential participants being pressured to participate or provide consent and to maintain voluntary participation in the study. The second email to the participant requested probable dates/times for the interview or if this was already provided then confirmation or an alternative of the interview date/time along with the request to provide consent prior to the interview. In most cases, signed consent was received and when needed kind reminders were sent to ensure that consent was obtained before the interview date. There were no sensitive populations such as children involved in the study that required special provisions.

During the online interviews, the researcher began with a self-introduction and the purpose of the study to build trust among the parties (Creswell & Poth 2018). Next, the researcher confirmed the consent received and permission to record the interview before starting the questions although signed consent was previously obtained. When the interaction between the participant and the researcher began, the researcher as interviewer remained within the research scope and interview questions. A few interviews naturally had a power imbalance and power was observed mainly among participants as experts on the area of interest. The

power imbalance was respected and only when needed the control of the interview was taken by the researcher over the line of questioning to ensure relevance yet avoid bias (Grbich 2009).

5.10.4 Ethical considerations in analysing data

In the attempt to respect the privacy of participants, each transcript from the interviews was labelled using a code in NVivo instead of the participant's name or organisation. This masking of names characterised each case by a stakeholder group and participant number with a composite profile (Creswell & Poth 2018). As analysis took place, small segments of data from the interview were assigned to codes that were emerging and within this process, the researcher collated diverse perspectives for each code with a combination of positive and contrary statements. This helped in developing a complex understanding of the issue addressed and gathering multiple perspectives for the next stage (Creswell & Poth 2018).

5.10.5 Ethical considerations in reporting data

It was evident that collected data held some sensitive information regarding higher education institutions in Sri Lanka. For instance, there were employee views on what was not being done or supported, although this was not the intention of the study. When reporting data, the researcher gave focus to honestly reporting data addressing the research questions, without disclosing any information that potentially could cause harm to participants in the present or future (Creswell & Poth 2018). Findings from the investigation were presented in clear communication and appropriate language for the intended audience of this study (Creswell & Poth 2018). Each research question was met with a distinct section of analysis and findings including a set of telling excerpts from the interviews and a relevant data visualisation to make a composite point of view. There were multiple perspectives respecting every participant's opinion and findings that complemented or contradicted existing literature.

5.10.6 Ethical considerations in publishing from the research

The sought outcome from this study is to fulfill the researcher's academic qualification in Doctor of Philosophy. In addition, the researcher and the supervisors published and intend to publish findings from the study. However, to honour the literature and findings of the study, key sections of the dissertation were published and planned for publication instead of aiming to 'piecemeal' multiple publications of smaller parts (Creswell & Poth 2018). In this way, some findings were and will not be used for more than one publication in the same genre. As it is important to share the curated knowledge with participants of the study and the wider audience that could apply this knowledge, there is a plan for more suitable publications such as articles

in newspapers and business magazines sharing the practical information. This helps to tailor the reporting of the study to diverse academic and practical audiences.

5.10 Chapter summary

This chapter discussed the research design of this study in detail. This study explores HEEEs for students E&I capabilities in a resource-constrained environment. Given the research focus and needs, this study undertook an interpretivist perspective to the research of HEEEs with a social constructivism paradigm and hermeneutical phenomenology approach. As the meaning of data is interpreted by the researcher with this study, this chapter acknowledged the researcher's role and values on the research process. The participants represented the HEEEs and the wider entrepreneurial ecosystem. Internal stakeholders (deans/heads of schools and academics/educators) represent the higher education institutions while external stakeholders include alumni entrepreneurs, established entrepreneurs and support professionals. Upon data collection of 40 semi-structured interviews, a combination of theory-driven and data-driven analysis was conducted. Data collection and data analysis followed processes suggested by Creswell and Poth (2018) for high quality research. All research design decisions were based on procedures, features and considerations of a study undertaking social constructivism and hermeneutical phenomenology approaches. Two types of validation for interpretive research (ethical validation and substantive validation) were embedded into the research process as suggested by Augen (2000). In this investigation, there were several challenges and these were acknowledged. Finally, the research obtained ethics approval from the Swinburne University of Technology Human Research Ethics Committee and this chapter concluded with the ethical considerations prior to the study, during the study and after the study. The next chapter is the first empirical chapter, addressing research question one.

CHAPTER 6: FINDINGS AND ANALYSIS FOR RESEARCH QUESTION 1

6.1 Chapter overview

This qualitative interpretative research conducted a series of 40 semi-structured interviews. The first research question explores multi-stakeholder perspectives on how diverse stakeholders anticipate the continued development of HEEEs in a resource-constrained environment. Having established that HEEEs are still emerging in the field of entrepreneurship, this question focuses on the development of the concept. The chapter, structured as in Figure 6.1, includes the existing condition of HEEEs in a resource-constrained environment and views on their continued development as perceived by internal stakeholders who represent the HEEE itself and external stakeholders from the wider entrepreneurial ecosystem.

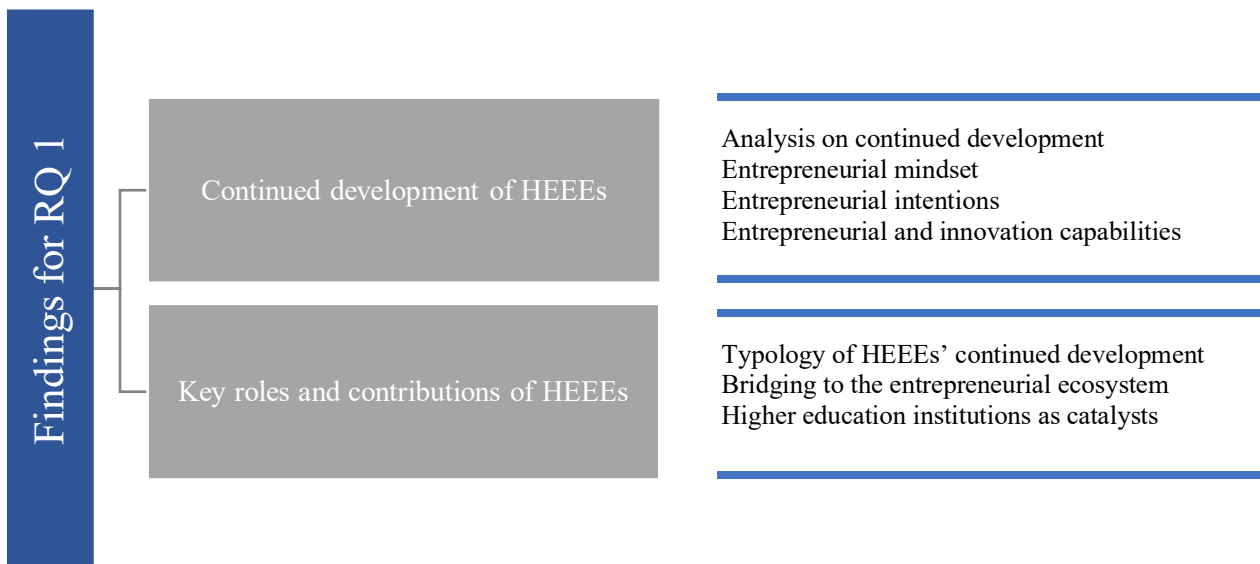


Figure 6.1 – Chapter 6 outline

In this chapter, the perspectives on the continued development of HEEEs are first presented using a reorder matrix representing each participant and their views of the importance of the three HEEE pathways. This reorder matrix is supported with data extracts of multi-stakeholder perspectives on entrepreneurial mindset, entrepreneurial intentions, and E&I capabilities. Next, the chapter reports on the key roles and different contributions of HEEEs, followed by two sections on bridging to the entrepreneurial ecosystem and higher education institutions as catalysts. These two sections contribute to the first research question of this study on the continued development of HEEEs, through the views of stakeholders.

6.2 Analysis of diverse stakeholder perspectives on continued development

This qualitative research aimed to explore HEEEs: the continued development of HEEEs, their composition and configuration including contextual factors, and stakeholder engagement within HEEEs in a resource-constrained environment. To gather broad coverage of viewpoints, the research investigated diverse stakeholders including deans/heads of schools and educators of higher education institutions, alumni entrepreneurs, established entrepreneurs, angel investors and support professionals. Two rounds of interviews were conducted, resulting in a total of 40 participants (refer Table 6.1).

Table 6.1 – Distributions of participants

Internal stakeholders <i>Total participants (n = 12)</i>	External stakeholders <i>Total participants (n = 28)</i>
Deans/heads of school (n = 6)	Alumni entrepreneurs (n = 10)
	Established entrepreneurs (n = 6)
Academics/educators (n = 6)	Angel investors (n = 6)
	Support professionals (n = 6)

A content analysis was conducted to arrive at findings addressing the first research question. The section presents the three-level coding data structure resulting from the inductive approach of analysing perspectives on how diverse stakeholders anticipate the continued development of HEEEs in Sri Lanka (refer Figure 6.2). By exploring the interview data and identifying themes within multi-stakeholder perspectives, three pathways of HEEEs emerged, representing the development of HEEEs. The first round of interview data was coded for all three pathways while understanding deepened through the second interview data that found roles and contributions of HEEEs. To arrive at the three aggregated themes, internal and external stakeholders were questioned on their lived experiences and observations of HEEEs using the below interview questions:

- What do you think about current HEEEs among private higher education institutions?
- How do you expect these HEEEs to develop in the future?
- What should higher education institutions focus on in their HEEEs?

During the analysis process, first-level codes were broadly noticed within the dataset. Having identified patterns within the participants' experiences, three sets of codes were initially labelled and coded to data. These initial codes are based on general opinions such as 'stimulate

beliefs and thought process towards entrepreneurship’. Then, this initial code was expanded to more abstract concepts with a theoretical background such as ‘goal orientation’, ‘prior knowledge’ and ‘social influence’. For the last level, coding led to the aggregated themes, and the first theme was ‘entrepreneurial mindset’. In this case, the continued development of HEEEs in a resource-constrained environment is related to mindset, intentions and capabilities. Figure 6.2 shows a thematic structure of the synthesised themes and codes along with the relationships between them.

RQ1: How do diverse stakeholders anticipate the continued development of HEEEs in a resource-constrained environment?

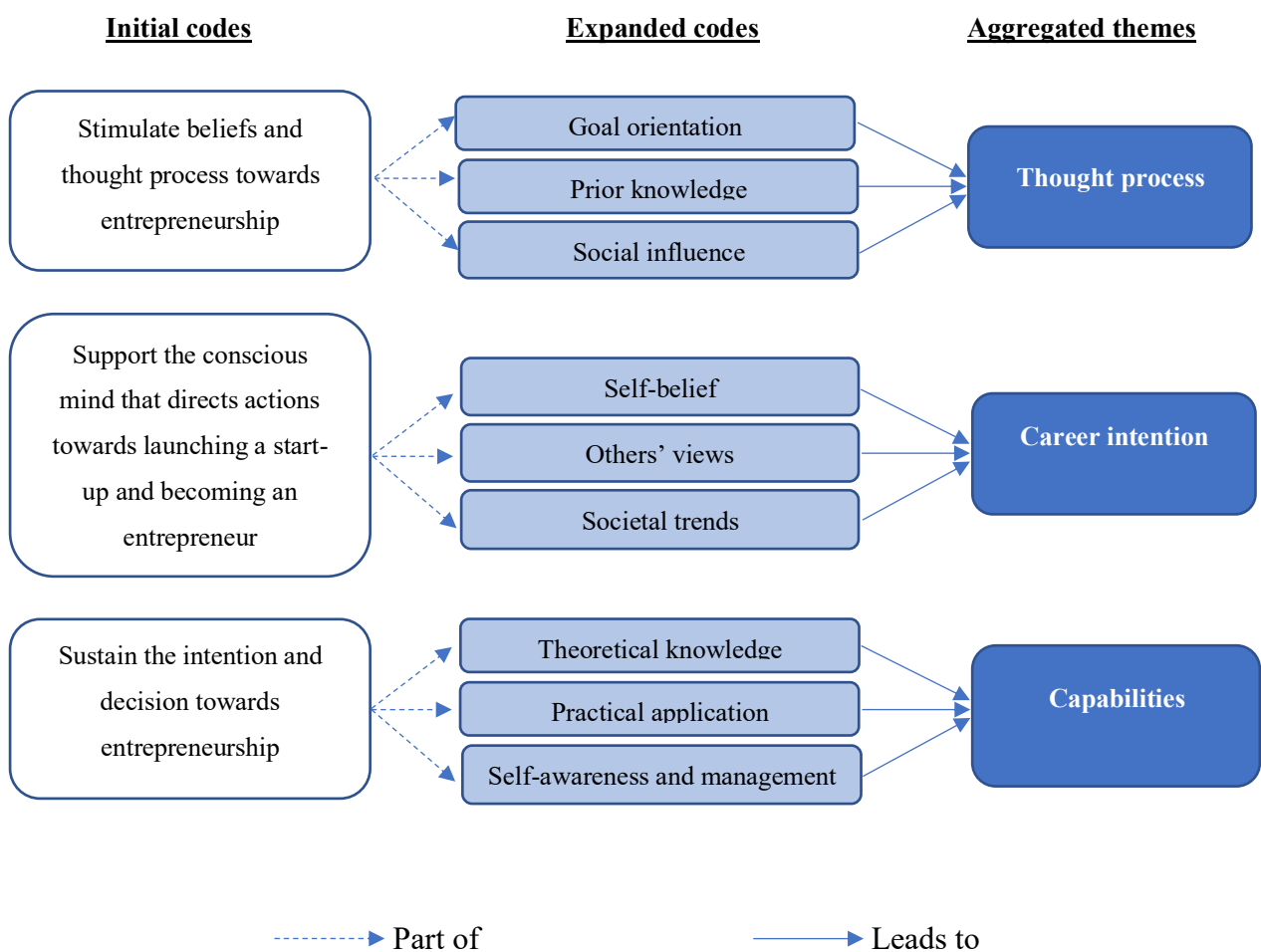


Figure 6.2 – Theme structure for continued development of HEEEs

6.3 Continued development of HEEEs

Interview questions related to the first research question asked participants to share their views and opinions about the current stage of HEEEs and their future development. Internal stakeholders including deans/heads and academics/educators spoke about the present learning environment and activities offered in their HEEE. Alumni entrepreneurs reflected on their recent HEEE experience during their higher education journey. Other external stakeholders such as established entrepreneurs, angel investors and support professionals shared their current associations with HEEEs to explain their existing conditions and suggest progress needed in HEEEs. All participants, internal and external, hold positive opinions of HEEEs and value their potential towards entrepreneurship for students.

Both internal and external stakeholders shared a consensus that HEEEs of private higher education institutions in Sri Lanka are still in their early stage of development (refer Table 6.2). Despite entrepreneurship being a national priority in Sri Lanka, entrepreneurship as a strategic choice is relatively new within the private higher education sector. Existing HEEEs are observed to be in their introduction stage, somewhat focusing on fostering entrepreneurial mindsets and encouraging intentions among students. According to the statements made by internal stakeholders, HEEEs are more organically formed, with minimal drive from senior management. Students and educators are promoting entrepreneurship within existing initiatives, while well-planned initiatives are still taking form. External stakeholders such as angel investors and support professionals agree that HEEEs are still emerging and evolving, whereas the entrepreneurial ecosystem is in more of a growth stage with initiatives set up, connections made, and results recognised.

Table 6.2 – Illustrative quotes about the current stage of HEEEs in Sri Lanka

Interviewee	Data extracts
DH5, a chief academic officer	“that it’s still it’s [HEEEs] in the very early stage”
AC4, an academic teaching an entrepreneurship unit	“Entrepreneurship ecosystems among the higher education bodies in Sri Lanka is still an evolving area”
AE3, a young entrepreneur of a fitness start-up	“So I guess, in its [HEEE] early stage, it is more about promoting entrepreneurship among students like getting into their minds”

Table 6.3 – Reorder matrix of HEEE’s continued development

		Important	Somewhat important	Not discussed
	Interviewee	Entrepreneurial mindset	Entrepreneurial intention	Entrepreneurial & innovation capabilities
Internal stakeholders	Dean / Head of school 1			
	Dean / Head of school 2			
	Dean / Head of school 3			
	Dean / Head of school 4			
	Dean / Head of school 5			
	Dean / Head of school 6			
	Academic / Educator 1			
	Academic / Educator 2			
	Academic / Educator 3			
	Academic / Educator 4			
	Academic / Educator 5			
	Academic / Educator 6			
External stakeholders	Alumni entrepreneur 1			
	Alumni entrepreneur 2			
	Alumni entrepreneur 3			
	Alumni entrepreneur 4			
	Alumni entrepreneur 5			
	Alumni entrepreneur 6			
	Alumni entrepreneur 7			
	Alumni entrepreneur 8			
	Alumni entrepreneur 9			
	Alumni entrepreneur 10			
	Established entrepreneur 1			
	Established entrepreneur 2			
	Established entrepreneur 3			
	Established entrepreneur 4			
	Established entrepreneur 5			
	Established entrepreneur 6			
	Angel investor 1			
	Angel investor 2			
	Angel investor 3			
	Angel investor 4			
	Angel investor 5			
	Angel investor 6			
	Support professional 1			
	Support professional 2			
	Support professional 3			
	Support professional 4			
Support professional 5				
Support professional 6				

6.3.1 Entrepreneurial mindset

The consensus from this empirical study is that HEEEs should foster entrepreneurial mindset among students. Entrepreneurial mindset is explained as a ‘way of thinking’ (Ireland, Hitt & Sirmon 2001) and the way entrepreneurs ‘think, reason, make decisions and set goals’ (Baron 2014) that is different from non-entrepreneurs (Davis, Hall & Mayer 2016). Such an entrepreneurial mindset will enable potential entrepreneurs to move from exploration to exploitation in the entrepreneurship process (Ucbasaran et al. 2003).

Six out of 12 (50%) internal stakeholders expressed the importance of fostering an entrepreneurial mindset among students while 17 out of 28 (60%) external stakeholders also expressed the same (refer Table 6.3). Some stakeholders pointed out that entrepreneurial mindset should be the most important priority of HEEEs, while others suggest that entrepreneurial mindset and E&I capabilities are equally important. For example, one internal and one external stakeholder shared the consensus that mindset as equally important as capabilities:

Interviewee DH2, a head of school: *“So if I were to rank these three, I would say, capabilities is one and mindset is equally important.”*

Interviewee AE6, a co-founder of a men’s fashion start-up: *“I think it’s a combination of the things that these ecosystems should focus on. So, there is the intention. But the mindset or the entrepreneurial mindset is most important. And the capabilities of course.”*

Data extracts related to entrepreneurial mindset from the interviews explain a range of reasons for the importance of entrepreneurial mindset within an HEEE. In most interviews, stakeholders spoke of entrepreneurial mindset as the way of thinking about entrepreneurship as a career choice and a start-up. Further, higher education institutions being entrepreneurial results in a broad range of activities including the development of an entrepreneurial mindset (Etzkowitz & Klofsten 2005).

When considering the environment, entrepreneurship as a career choice among students is still not commonly accepted by the education system and wider society. Higher education institutions tend to teach students to become proficient employees instead of successful entrepreneurs (Solomon 1989). The larger belief among these systems is for students to complete their undergraduate degrees and continue into corporate jobs. Therefore, both internal

and external stakeholders argue that students should be exposed to alternative career options such as entrepreneurship and break through such fixated thinking.

Interviewee DH4, a head of academic affairs: *“Because end of the day, we don’t want these sorts of box minded students going out there, thinking that the only option is corporate life. So, I think that’s where the mindset needs to change, and we as higher education institutions have a significant role to play. If you give them [students] the exposure and platforms during the academic period, I think their minds will open to these trends and identify their own strengths.”*

Interviewee AC2, an academic in charge of an entrepreneurial initiative: *“Most of the students come to us, having the mindset that we must finish the degree and we have to do a job. They are not open to anything entrepreneurial, accepting risks and trying something new. So, I think we need to step in here. I think mindset is critical, developing the mindset required for a student because I personally believe mind drives you for whatever the things you do. With the right mindset, they are bound to take on entrepreneurship as a career and create jobs.”*

Interviewee AE9, an alumni entrepreneur with a tech start-up: *“So I would say, being able to help students build that mindset by putting them on the spot, validating their ideas, and showing them alternate paths to the same goal without breaking the spirits, of course. Students need to build that mindset of being entrepreneurial rather than no I cannot I do not want as excuses.”*

Interviewee AI5, an angel investor: *“So my simple answer is mindset. I think mindset is perhaps the most important thing that education institutions must develop. And when I say mindset, they must be given a realistic understanding of what entrepreneurship means.”*

Fostering an entrepreneurial mindset among students implies a higher education experience that constitutes values, beliefs, attitudes and emotions associated with E&I. At the same time, promoting an entrepreneurial mindset among students can affect society. Creating an entrepreneurial mindset among students and educators can become a priority in contributing to societal development (Gibb et al. 2009). Given the impact of the COVID-19 pandemic, higher education institutions need to incorporate an entrepreneurial mindset within their HEEE as entrepreneurship has become a necessity more than a choice for some youth. These entrepreneurs identify business opportunities and generate innovative ideas, not because they

want to launch a new business but as an alternative for their survival (Maritz et al. 2020). An external stakeholder from the wider entrepreneurial ecosystem spoke about how mindset plays a role in becoming an entrepreneur. Interviewee AI3, an angel investor, said:

“First of all, you must really start thinking about that and it’s a mind game. I mean, many entrepreneurs become entrepreneurs, because they are in a mind space where they understand that the current solution is not good. Right? And they can create something better. They take the risk of going out and doing it. Right now, how did Zoom start? I mean, I’m sure you know, the story of Zoom ...”

An entrepreneurial mindset can stimulate beliefs and open the boxed thought process towards entrepreneurship. A variety of internal and external stakeholders emphasised that entrepreneurial mindset should be given key priority within HEEEs by higher education institutions, which can lead to students developing as entrepreneurs. Where students share an entrepreneurial learning experience and receive support towards entrepreneurship, students can gain an entrepreneurial mindset. For example, one internal and one external stakeholder shared the consensus that higher education institutions and their HEEEs are responsible for fostering an entrepreneurial mindset among their student community.

Interviewee AC1, an academic teaching entrepreneurship: *“First of all, there must be a kind of a psychological or mindset change. So, I would say, when it comes to that mindset change, there are many factors that will impact this transformation. But out of the factors, I would say that our ecosystems including education and network plays a huge role.”*

Interviewee SP4, an external mentor in entrepreneurship: *“As an element, education institutions give them the basics such as education to understand the entrepreneurship subject matter. But the entrepreneurship mindset, now that’s a totally different, I would say. A lot of mindset change is necessary, because launching a start-up has not yet become the acceptable thing by the society and by the education system. I would say, an institution should instil the spirit for this entrepreneurial mindset.”*

Efforts within the HEEE facilitate advancing the mindset when it is driven by internal stakeholders including deans/heads and academics. Higher education institutions have found effective strategies for creating an entrepreneurial mindset through entrepreneurship education (Etzkowitz & Leydesdorff 2000; Fayolle 2013). Further, HEEEs hold the aim of developing entrepreneurial awareness and mindsets among students through linkages and a variety of

activities including business idea presentations, open innovation challenges, enterprise projects and business games (Secundo et al. 2020). To develop potential entrepreneurs among students, HEEEs must create entrepreneurial mindsets through psychological elements that orient feelings, intentions, motivations, and behaviours of students.

6.3.2 Entrepreneurial intention

There is a mixed result about HEEE encouraging entrepreneurial intention among students. Entrepreneurial intention refers to the state of mind that influences attention towards creating a new venture, at some point in time (Tomy & Pardede 2020; Thompson 2009). Some stakeholders only expect HEEEs to play a pivotal role in fostering entrepreneurship and supporting students to take up a viable career where the intention and decision to become an entrepreneur is voluntary. Others perceive that higher education institutions should promote entrepreneurship and influence the entrepreneurial intention.

Only four stakeholders per category expressed the importance of promoting an entrepreneurial intention among students (refer Table 6.3). Most stakeholders have different views on promoting entrepreneurial intentions among students within HEEEs. Entrepreneurial intention is understood as a career choice to becoming an entrepreneur and launching a start-up. One stakeholder highlighted that no student plans to become an entrepreneur and that entrepreneurship takes its own course of action according to circumstances.

Interviewee AI3, an angel investor: *“Nobody intends to be an entrepreneur, it’s just you go down a certain path. Right ...”*

Some stakeholders suggest entrepreneurial intention as a separate priority that higher education institutions should have for their HEEEs, while others were of the viewpoint that fostering mindsets and intentions happen together. Entrepreneurial higher education institutions bear a third mission oriented towards transforming mindsets, intentions and actions of students and academic programs are being designed to influence entrepreneurial intentions of students (Guerrero, Urbano & Gajón 2020; Nabi & Liñán 2011; Pittaway & Cope 2007). For example, four internal stakeholders and one external stakeholder emphasised that higher education institutions and their HEEEs should promote entrepreneurial intentions among students.

Interviewee DH3, a head of school: *“There are foundations for entrepreneurship in our learning environment and students are developing awareness and intention, so that they know that this is also a career choice for them.”*

Interviewee DH2, a head of school: *“I would rank that [intention] last, but because I think we don’t necessarily have to create the intention among students. I think because that self-made intention needs to come from within students. I think there is very little that we [institutions] can do in terms of creating that, that intention, but mindset is a different thing.”*

Interviewee AC3, an academic teaching entrepreneurship: *“Education institutions, we have a key role to play here. In terms of, you know, building that mindset and creating that intention through awareness.”*

Interviewee AC5, an academic teaching a career planning module: *“Networks and partnerships are crucial for it, I mean, for private education institute to have because otherwise, what happens is students are only limited to their degree program and the institution walls. So that’s not enough when it comes to, you know, creating that mindset and intention. Because you know it is the most important thing.”*

Interviewee AE6, a co-founder of a men’s fashion start-up: *“I think it’s a combination of the things that these ecosystems should focus on. So, there is the intention. But the mindset or the entrepreneurial mindset is most important. And the capabilities of course.”*

When entrepreneurial intention is being considered on its own, it is identified to be of least importance compared to mindset and capabilities due to two reasons. First, both stakeholder categories, internal and external, point out that having an entrepreneurial intention is individual and students should be given the freedom to make that career choice, if they wish to embark on a self-made journey. Like other career choices, becoming an entrepreneur is driven by the individual’s passion, traits and characteristics. Second, internal and external stakeholders further indicate that entrepreneurial intentions among students are strongly influenced by their parents and the wider community they live in. Parents have control of their children’s future and others, including friends, tend to set expectations for these students. One HEEE study found that entrepreneurial behaviours of parents positively affect students’ entrepreneurial intentions (Webber, Kitagawa & Plumridge 2020).

Interviewee SP5, a support professional working with incubators and accelerators: *“Students nowadays they have that intention to become entrepreneurs. Whereas I guess during our time with it was more about you know, career focused like, where do we want to work? So yes, intention is quite important, but I feel it is a more personal thing.”*

Interviewee EE3, a second-generation entrepreneur: *“I think career intentions are heavily influenced by parents and social trends. While this is the case, students may go about having intentions based on their confidence and capabilities. I think there is a limit to institutions creating intentions, but they can influence those intentions through the education and various experiences offered.”*

Rather than considering a career pathway led by education or qualification, youth in Sri Lanka intend to become entrepreneurs based on their experiences (Dissanayake 2020). Stakeholders stated that life events that take place over time are likely to trigger an individual’s aspiration for an entrepreneurial career. For example, children are commonly involved in parental family business and such experiences can cause youth to take the same career path. Studies in entrepreneurship have found that the relationship of a family’s E&I history has an influence on students’ entrepreneurial propensity (Bock et al. 2020). Another influence is prior experiences with social problems leading to social entrepreneurial intentions (Hockerts 2015). Potential entrepreneurs with experience in a recycling program or a charity program are more likely to be driven towards solving a social problem, through an entrepreneurial initiative. Therefore, prior experiences are a key influence on youth towards launching start-ups as they are experienced compared to ones with no similar experience (Shirokova et al. 2017).

Another viewpoint that came to light in this research was that students may intend to become entrepreneurs by being influenced by their broader environment. In addition to students who want to follow their parents’ career path and pursue entrepreneurship, some students intend to launch start-ups and become entrepreneurs because of disruptive events. Economic crisis is a factor when youth are motivated to emerge from economic crisis and survive hardship by embarking on entrepreneurship (Dissanayake 2020). Due to the prolonged civil war followed by economic instability in Sri Lanka, a portion of educated students intend to start small ventures out of necessity for their survival and hope for a better life. To mitigate the critical effects of disruptive events, entrepreneurs engage in entrepreneurship and innovation (Posen et al. 2018). The COVID-19 pandemic is considered as one of the worse disruptions in

recent times, causing an unprecedented challenge for people around the world, especially in developing countries. Being challenged by such economic hardship or disruptions can lead to ‘necessity’ entrepreneurs (Maritz et al. 2020).

Interviewee A11, an angel investor: *“When living in a developing country like Sri Lanka, potential entrepreneurs including these students naturally develop an attitude to cope up with changes in the environment. For us these changes include business uncertainty and economic crisis. We are still going back and forth when political parties changes and now we are in the worst economic crisis Sri Lanka as ever faced right? This triggers them [students] to take control.”*

The various viewpoints shared by internal and external stakeholders emphasise that entrepreneurial intentions of students are predominately influenced by micro (e.g. home background) and macro environments, leaving higher education institutions to focus on supporting career aspirations more than encouraging intentions. This shared consensus in the research contrasts to a large portion of literature that articulates the role of higher education institutions and their HEEEs in promoting entrepreneurial intentions among students. In Mexico, an emerging economy, a study found results on HEEEs facilitating employability options including entrepreneurship education reinforcing graduate work effort and incubators reducing graduate risk aversion (Guerrero, Urbano & Gajón 2020).

Higher education institutions should become catalysts for economic and societal development and produce entrepreneurial capital (Audretsch 2014; Guerrero, Cunningham & Urbano 2015). In this vein, stakeholders claim HEEEs focus on creating an entrepreneurial mindset and supporting students as students develop entrepreneurial intentions within collective dynamics mostly outside the higher education institutions. To support students towards entrepreneurship, HEEEs can influence students’ self-efficacy by developing their E&I capabilities relevant for an entrepreneurial career. A range of HEEE factors with the involvement of diverse stakeholders may influence a student’s development and ability to become an entrepreneur. When students who are keen to pursue entrepreneurship seek to develop internal capability and obtain support, it should be found within the higher education environment. Students with E&I capabilities are likely to feel confident that they are prepared for entrepreneurship as a career and have the necessary skills to launch a new start-up as an entrepreneur.

6.3.3 *Entrepreneurship and innovation capabilities*

Stakeholders held the strong view that HEEE should pay attention to the human capital developed more than intention or mindset. They emphasise that HEEEs should develop students to solve problems, innovate solutions, handle uncertainty, collaborate with others, leverage resources, mitigate risks and make informed decisions. Entrepreneurial capabilities refer to knowledge and skills related to the entrepreneurial process, judgmental abilities and decision making related to entrepreneurial action, and social skills and networking abilities (Alsos et al. 2022). E&I capabilities is a new construct that emerged in this study, although it is not new in entrepreneurship education and entrepreneurship education ecosystems.

Eight out of 12 (67%) internal stakeholders and 21 of 28 (75%) external stakeholders also expressed the importance of developing E&I capabilities among students (refer Table 6.3). Thus, the broad consensus among internal and external stakeholders is that developing students' capabilities should be the priority within the HEEE. Given that HEEEs are in an introductory stage among higher education institutions in Sri Lanka, stakeholders suggest that priorities should be elevated to capabilities from mindset and intention as progression. These capabilities are understood as a combination of knowledge, skills and attitude needed to successfully launch a start-up and be an entrepreneur.

Stakeholder calls for higher education institutions to pay more attention to developing capabilities among students were twofold. First, some external stakeholders including entrepreneurs and investors reflected on their experiences and argued for the need for students to develop the abilities to identify, evaluate and exploit opportunities within the dynamics of a resource-constrained environment. Second, internal and external stakeholders agree that they observe that some young entrepreneurs fail in entrepreneurship due to a lack of relevant capabilities. Thus, the emphasis on capability development was based on these two dominant views held among both stakeholder categories.

Interviewee DH5, a chief academic officer: *“It is, I think, it will be all three. But I think more than intention. For me, I think, as a private Higher Education Institute, what we need to kind of focus on is the mindset, and perhaps more importantly, the entrepreneurial capabilities.”*

Interviewee AC4, an academic teaching an entrepreneurship unit: *“So from my observations, obviously, we need to give them [students] the knowledge on entrepreneurship. But see, even if you're educated about entrepreneurship, you really*

need the capabilities, so I think entrepreneurial capabilities is important. When you're talking about starting your own company, it's less about knowledge, but more about your capabilities in being an entrepreneur and your capabilities to become an entrepreneur."

Interviewee AE7, an alumni entrepreneur: *"Education is important, I mean, from school to higher education. All levels of education are important. But that education setting with so many other things must develop the entrepreneurial capabilities within innovation and build discipline in students who want to turn out as entrepreneurs, at least for me that was it."*

Interviewee AE10, an alumni entrepreneur who founded a start-up in fashion: *"Now students are being exposed to successful entrepreneurs, so that mindset is starting to develop. Because they see a lot of entrepreneurs today, but it is the capabilities students are lacking. And that is where I think private higher education institutions should really focus on."*

Entrepreneurial higher education institutions play a fundamental role in knowledge-based entrepreneurial economies (Acs et al. 2009; Audretsch 2014; Link & Sarala 2019) through the development of entrepreneurial capabilities and the creation of conducive environments for students to pursue entrepreneurship (Kirby 2004; Mian et al. 2016; Morris et al. 2017). From the interviews, it was understood that academics, to some extent, felt inadequate in developing capabilities of students as they highlighted that senior management needs to accept and commit to preparing students for entrepreneurship as an alternative career. Although all educators emphasised that business/management students should learn about entrepreneurship, they pointed out that some higher education institutions did not offer a single entrepreneurship-based module in the degree program and entrepreneurship was introduced to students through other disciplines. This unavailability of core and elective entrepreneurship modules has a chain reaction where students from other study programs such as computing and law also lack the opportunity to gain knowledge on entrepreneurship.

Interviewee AC6, an academic: *"I think it is the dean or the head that needs to push and be there, mainly to make sure that these initiatives are sustained to give that commitment to developing entrepreneurial capabilities in students. See, as academics, we can't do that on our own."*

Academic experiences must deliver knowledge to students by creating a conducive environment for entrepreneurial opportunity and innovative breakthroughs (Fayolle 2013; Guerrero et al. 2016; Bergmann et al. 2016). When stakeholders identified capabilities as a priority that higher education institutions should commit to and involve within their HEEEs, they were clear on the type of capabilities. While more internal stakeholders highlighted entrepreneurial capabilities, external stakeholders emphasised capabilities in E&I. The suggestion for E&I was supported by the notion that innovation is a capability that potential entrepreneurs must possess. Further, emphasis was made on Sri Lanka's national interest in harnessing technology-based entrepreneurship driven by innovation. Therefore, stakeholders encourage higher education institutions to understand the critical role played by E&I capabilities in the entrepreneurial process and in the success of entrepreneurs.

Interviewee DH2, a head of school: *“So if I were to rank these three, I would say, entrepreneurial capabilities were one and mindset is equally important.”*

Interviewee AC5, an academic teaching a career planning module: *“Along with creating this mindset, we need to give these students these entrepreneurial capabilities, we don't have in our students. We could give them the research skills and the deeper insights into you know, what it takes to be an entrepreneur and what you need to go through in starting a new venture. “*

Interviewee AE1, an alumni entrepreneur who founded tech start-ups: *“Capabilities in entrepreneurship and innovation, of course, is number one, that is what they need to be doing. That is what we need to be pushing for them to develop these capabilities. Because that is what is lacking. Because I think intention and mindset, if we look at current students today, they do have an intention. They also may have the mindset to a certain extent ... ”*

Interviewee EE1, a second-generation entrepreneur and co-founder of a global brand: *“I think factors that inhibit entrepreneurship is that when we are a little too close, and it forces it to be a little open ended, we need to go beyond theory and let people imagine you do need to encourage their free spirit, you need to empower people to go out and teach their ideas to do, too. You must empower your students to be creative and create innovations. Essentially in entrepreneurship, if you're going out and creating something, give them what is required to be innovative thinkers and give them enough knowledge to create that foundation that allows them to create from and then grow.”*

External stakeholders further elaborated on capabilities being the underlying ability to execute ideas and strategies. More precisely, entrepreneurs, investors and support professionals stated that students should be equipped with execution capabilities as they develop within HEEEs. To improve their preparedness for the entrepreneurial process, students need to develop their abilities in launching a start-up and being an entrepreneur. In doing so, these stakeholders emphasised that students should be given the opportunity to learn by doing in an HEEE. For example, three external stakeholders emphasised developing execution capabilities and not just any capabilities relevant for entrepreneurship.

Interviewee AI1, an angel investor: *“So talking about the most important thing, these execution capabilities. Starting from problem solving capabilities, or deconstructing the problem that people face, everything understanding the market and industry to from being comfortable in working, building relationships ... ”*

Interviewee AI2, an angel investor: *“If a student wants to start a company today, the cost of starting a company is zero. You don’t really need to spend anything to start a company, even to get sales, you don’t really need to spend much. If you understand how to operate digitally, you can start a business and you can grow that business. That requires your capabilities to execute. But I don’t see that stuff happening in Sri Lankan higher education institutions.”*

Interviewee EE6, a social entrepreneur: *“If I take myself or myself as an example, how I came about doing what I’m doing today as an entrepreneur, the first key thing would be passion. This passion is cultivated within me and of course it’s very personal. But to implement my passion and launch my start-up I turned to my capabilities. If I had what it took to become an entrepreneur.”*

Often, entrepreneurship programs offered by higher education institutions relate to new venture creation and small business management while educating students ‘about’ entrepreneurship instead of developing students ‘for’ entrepreneurship with the relevant capabilities (Kirby 2004). In this case, in contrast to internal stakeholders who emphasised the former, external stakeholders highlight the latter being the need for HEEEs to develop capabilities ‘for’ E&I. External stakeholders including entrepreneurs, investors and support professionals pointed out that students keen to pursue an entrepreneurial career would benefit from a variety of capabilities.

Some entrepreneurs appreciated the theoretical knowledge about entrepreneurship by asserting that it lays the foundation that capabilities are built on. A few other entrepreneurs highlighted the importance of self-management capabilities as potential entrepreneurs. Investors were most keen on practical capabilities, such as opportunity seeking and problem solving, to successfully launch a start-up. Support professionals who undertake the role of mentors to young entrepreneurs stated that developing emotional skills, such as self-awareness, is vital for entrepreneurial success. While literature highlights the emotional challenges that entrepreneurs encounter during their entrepreneurial journey, the efforts of education should equip entrepreneurs with the emotional skills they need to thrive (Aly, Audretsch & Grimm 2021). Input on the variety of E&I capabilities recognised elements beyond the balanced skill set of hard and soft skills.

Interviewee SP5, a support professional working with incubators and accelerators: *“I think that beyond entrepreneurial knowledge, these students can really benefit from emotional intelligence. Emotional skills will leverage their problem solving which is a something they do as an entrepreneur and help them with being social as they navigate through their networks.”*

Interviewee SP6, a mentor for young entrepreneurs: *“To be a leader, to be an entrepreneur one must have self-awareness. Understanding where they stand emotionally will help students to become and be entrepreneurs. This distorts perceptions and creates awareness of others and importantly the world out there helping them making better decisions day in and out.”*

Interviewee AI1, an angel investor: *“Being an entrepreneur and living life an entrepreneur is no walk in the park. You are faced with challenges and roadblocks on the journey. Having emotional skills will make young entrepreneurs handle situations and difficult conversations. Especially take control of their own emotions that can get in the way.”*

When entrepreneurs engage in entrepreneurship, they are especially influenced by their cognition, emotions and behaviour. However, one aspect that goes unnoticed is the high levels of affective intensity when engaging with entrepreneurship that includes self-awareness and management. Understanding one’s own strengths, emotions, motivation, integrity, control and regulation, confidence and wellness are the key areas that came to light in the interview data.

All these are identified as significant by stakeholders, since they impact the development of E&I capabilities that translate to being entrepreneurial.

6.4 Key roles and contributions of HEEEs

6.4.1 Typology of HEEEs' continued development

Interviews with internal and external stakeholders of HEEEs canvassed a range of aspects dealing with the development of HEEEs, their composition and configuration, and ecosystem engagement for this study. In addition to the current stage of HEEEs reported in Section 6.3, the first set of interview questions probed the working of the HEEEs, any observed gaps or inadequacies with respect to their functioning, and opportunities for HEEEs to contribute to the wider entrepreneurial ecosystem. Responses to these questions were themed into five key roles: influential, developmental, networking, entrepreneurial and regional (refer Table 6.4). HEEEs in their evolved form offer multiple supports for their community including students (Fuster et al. 2018) and must realise their contribution to the wider entrepreneurial ecosystem. On the surface, according to the labels these roles may seem typical, however the contribution can be found in the uniqueness related to the resource-constrained context encompassed in the roles.

Not learning about similar entrepreneurial start-ups, not understanding oneself, not connecting with people in and related to entrepreneurship, not having a mentor/advocate, and not knowing what is happening in the real world are key challenges that stakeholders understand that students face within HEEEs. HEEEs are meant to deal with these issues through their roles and contributions to develop students for entrepreneurship. In the context of entrepreneurship, higher education institutions bear the responsibility of ensuring their students thrive in their endeavours (Audretsch 2014).

Table 6.4 – Key roles and contributions of HEEEs

Key role	Type of role	Contribution / Expectation
Influential role	Leading	Foster an entrepreneurial mindset among students
	Guiding	Encourage entrepreneurial intentions among students
Developmental role	Governing	Build HEEEs with a system
	Facilitating	Develop students with capabilities relevant for entrepreneurship and innovation
Networking role	Community building	Connect students with other students
	Inspiring	Connect students with alumni entrepreneurs
	Mentoring Coaching	Connect students with external stakeholders
	Consulting	Connect students with specialised experts
Entrepreneurial role	Experimenting	Provide support to generate student start-ups Connect to points of support such existing incubators and accelerators
	Expanding	Provide programs and support to create spin-offs from research
Regional role	Coordinating	Align goals with national priorities
	Talent sourcing	Lead human capital development Provide entrepreneurial talent as a source

The most common role played by HEEEs is the role of ‘influential’. In this study, some stakeholders perceived that HEEEs play a role in fostering an entrepreneurial mindset and encouraging entrepreneurial intentions among students. The influential role was understood as an activity that was being undertaken to some extent by the HEEEs of higher education institutions. Although given their current influential role, stakeholders outside the institutions such as entrepreneurs and investors stated that HEEEs need to invest more effort by strengthening their dynamics within. Educators confirm that they actively work on the mindset and career intentions of students; however, they highlighted that HEEEs lack the institutional support in playing a more influential role that demands a stronger entrepreneurial drive. Senior leadership and their long-term commitment are considered significant for the effective functioning of ecosystems (Allahar & Sookram 2019; Bischoff, Volkmann & Audretsch 2017; Yu et al. 2017; Rice, Fetters & Greene 2014). Through entrepreneurial leadership, such leaders can remove barriers and carry out entrepreneurial change in a particular context (Gibb, Haskins & Robertson 2013). In this way, HEEEs can benefit from goal setting, strategy development, providing leadership and long-term commitment. As a resource-constrained environment, entrepreneurial leadership along with governance of HEEEs was perceived as far more

important. Therefore, it is essential to direct attention to the much needed reorientation of leadership among higher education institutions.

Interviewee DH2, a head of school: *“So we have the heads and the deans who are leading this entrepreneurial initiative, who are responsible to a large extent, and they must do it within their capacity. Then we have the academics and the educators ... Without the support of the deans, such initiatives would fail within a private education institution. So you definitely need commitment from the deans to sustain those initiatives. Because even if you have alumni, entrepreneurs, and other experts who in my opinion can contribute towards developing these entrepreneurs, no higher education institution can contribute to the same if you don’t have the support and commitment from the top. If senior management does not strongly believe in the need for creating that mindset and developing student entrepreneurs, they will continue to push students for cooperate jobs.”*

Interviewee AC3, an academic teaching entrepreneurship: *“We encourage students for entrepreneur. Right now. We don’t have that leadership promoting leadership although it is getting prominent as a country. We have our school-level objectives aligned to entrepreneurship. But the fact is, what’s really happening at operational level, I do have a question mark on that. Because we are limited when they try to do things because there is limited support from the top. In a country like ours, we need our leaders to realise our national priorities and work together for those, even as a private company right?”*

While the influential role was the most apparent, the other four roles of developmental, networking, entrepreneurial and regional were expectations of HEEEs from diverse stakeholders. With respect to the developmental role, an explicit expectation surfaced from the interviews that students need to be entrepreneurially developed with the capabilities and not just prepared academically. The developmental role of nurturing students with capabilities relevant for entrepreneurship was not evident within HEEEs in Sri Lanka as one would expect given that higher education institutions are entrusted with the responsibility of human capital development. Analysis of data extracts suggests that developing capabilities of students goes beyond theoretical knowledge and practical skills, including an element of self-awareness and management as an entrepreneur. For this, higher education institutions must be open to the environment and draw input from stakeholders in the entrepreneurial ecosystem on issues and

trends. All stakeholders should be involved in developing HEEEs (Rice, Feters & Greene 2014) and the development of capability among students needs to be a collaborative effort, especially when faced with resource constraints.

Expectations associated with the networking role were strongly represented in the interview data. An HEEE is expected to act as a network facilitator for students, enabling them to make connections with a variety of relevant stakeholders of the HEEE and its wider entrepreneurial ecosystem. Stakeholders pointed out that students have limited access to others and must be given the opportunity to be exposed beyond their HEEE and institution. Given the importance of social influence, it was suggested that students can benefit from building immediate relationships with students from the same and other institutions, and alumni entrepreneurs. Another point about networking was students being connected to the entrepreneurial community including investors, support professionals and experts for the purpose of mentoring and consulting. Students also seek the views of others and societal trends in their development as potential entrepreneurs. Higher education institutions should build communities through their HEEEs to advocate for entrepreneurship and support student E&I capabilities. For resource-constrained environments, it is of utmost importance for stakeholders within HEEEs and in the wider entrepreneurial ecosystem to work closely and they are stronger together.

Student start-ups launched through higher education institutions and their HEEEs have become an important contribution to economic development (Di Gregorio & Shane 2003; Wright, Siegel & Mustar 2017). Being a resource-constrained environment, the role of HEEEs being entrepreneurial is almost non-existent in Sri Lanka. In this role, HEEEs should act as a hothouse for all things entrepreneurial with various factors and diverse stakeholders, motivating students to engage in entrepreneurship through student start-up projects and enabling spin-offs through research. Such a role would mean that HEEEs reach their potential sustaining the momentum for entrepreneurial initiatives. Currently, higher education institutions and their HEEEs have not played a role in such an entrepreneurial initiative and have almost no noteworthy example as evidence. Some external stakeholders pointed out that this entrepreneurial role would be an ultimate outcome for HEEEs to achieve but higher education institutions are not just there yet. If necessary HEEE factors are not present due to resource constraints, mapping and creating points of connections to support is a means of providing a pathway for students who are interested in start-ups. Given resource constraints of HEEEs, they see possibilities for start-ups projects and spin-offs through engagement with

existing incubators and accelerators, and sponsorships from individuals and organisations in the wider entrepreneurial ecosystem.

Regional roles emerged primarily from the views of external stakeholders as a responsibility that current HEEEs are lacking. In the context of private higher education institutions in Sri Lanka, it became evident that there is a disconnect between the private higher education sector and national governance. At the institutional level, goals and objectives are less aligned with priorities of the country and operate more like a private business in education. At a national level, government bodies should attract the commitment from HEEEs and communicate expectations from the private higher education sector. HEEEs along with their institutions are expected to lead human capital development and provide entrepreneurial talent for the economy and entrepreneurial ecosystem. Based on these views, HEEEs should consider their regional role and scale up their commitment and leadership. In this case, HEEEs can make the education and experience of students more relevant to their country's needs, synthesise with national development and be in line with the world today.

The emergence of these HEEE roles add depth and breadth to the understanding of the development and functioning of HEEEs. Although the contributions from the five roles may have little radical new insights, the composite understanding of the various roles provides in-depth knowledge of how HEEEs can serve, as an entrepreneurial initiative and for the wider entrepreneurial ecosystem. Table 6.4 presents the five roles of HEEEs with their associated type of role and contributions/expectations, drawing on the synthesis of interview data relating to HEEEs' continued development. As described, it is a process of evolving in a systematic manner and the five roles can be understood as HEEE development in a resource-constrained environment. This acts as an inspiration for higher education institutions and stakeholders in the wider entrepreneurial environment on how to advance the HEEE and grow together.

6.4.2 Bridging to the wider entrepreneurial ecosystem

Generally, HEEEs are considered to be self-sustaining ecosystems and in this sense they are not part of a wider entrepreneurial ecosystem, although they interact with regional stakeholders (Lahikainen et al. 2019; Miller & Acs 2017). However, this research recognises the HEEE as a sub-ecosystem of the wider entrepreneurial ecosystem being a system of ecosystems (Wurth, Stam & Spigel 2021). Viewpoints from both internal and external stakeholders highlight that HEEEs and entrepreneurial ecosystems may be complementary, interconnected and independent in how they elevate to reach each other and as they relate to each other. In their

ongoing development, HEEEs cannot be separated from their wider entrepreneurial ecosystem and need to embrace support from the entrepreneurial community in delivering their key roles, including the development of E&I capabilities. To evolve into a fully-fledged HEEE, they must open up to their regional milieu and specifically its entrepreneurial ecosystem.

Especially in such resource-constrained environments, entrepreneurial initiatives within the HEEE can benefit from collaborating with the wider entrepreneurial ecosystem including stakeholders, such as other higher education institutions, entrepreneurs, investors and incubators. Although HEEEs are associated with a specific higher education institution, the various members share the same goal within a local geographic community. Formal and informal networks and connections between HEEEs and ecosystem stakeholders can enhance access to resources and contribute to optimal configuration (Theodoraki, Messeghem & Rice 2018). Stakeholders from the wider entrepreneurial ecosystem were clear and consistent that HEEEs need to build a layer of external stakeholders in addition to senior management, educators, students and staff who share the same goals and priorities. In this case, there is a need for HEEEs to create a bridge with their wider entrepreneurial ecosystem that can result in resource sharing. For a resource-constrained environment, the agenda of an HEEE should be formulated and revised constantly for the purpose of sustaining synergy and commitment for mutual benefit from various stakeholders.

Some HEEEs may emerge as a proactive response to new economic development or education initiatives while other HEEEs may be reactive responses to specific gaps in economic development or education resources (Rice, Fetters & Greene 2014). Therefore, stakeholders argue that higher education institutions play the role of a hub organisation in the wider entrepreneurial ecosystem where their HEEEs depend on collaboration and coordination between autonomous yet linked stakeholders. In a resource-constrained environment, HEEEs are characterised by this crucial role that leads to creating value for connected ecosystems. In doing so, higher education institutions need to find a balance between academic and market logic, as well as the logic of the entrepreneurial ecosystem, which consists of the entrepreneurial-market logic and community logic (Roundy 2017). The entrepreneurial-market logic includes guiding actions in the pursuit of creativity, innovation and development of new business models (Roundy 2017). When doing so, HEEEs can expose students to entrepreneurial-market logic through various factors and mechanisms including study programs, research and projects and thereby develop their capabilities in E&I. Further,

community logic will bring a community focus among students resulting in solving problems through E&I initiatives while helping the community.

6.4.3 Higher education institutions as catalysts

Given that HEEEs are an entrepreneurial initiative of higher education institutions, these institutions play a crucial role in their development. Higher education institutions claim that they have made significant investments, such as in their study programs and learning environments. However, stakeholders at the other end engaging with graduates question the relevance and usefulness of programs and efforts made by higher education institutions. To some extent, higher education institutions are managing their HEEEs poorly and do not have sufficient support to fulfill their function of entrepreneurship education and entrepreneurial support. They seem to have ignored creating the community value that should guide their HEEEs towards E&I initiatives for students. Continued development of HEEEs must address this relevance and resource constraints by developing the E&I capabilities of students.

One way to think about the continued development of HEEEs is the source of development itself. According to the interview data, self-employment is valued by academics but not by academia in Sri Lanka. The senior management and larger community are still fixated on preparing students for corporate jobs. Other stakeholders including entrepreneurs, investors and support professionals criticised this fixation, bringing a focus to the real promise of higher education. Academia's fixation on corporate careers for students can restrict the continued development of their HEEEs, leading to lack of relevant capabilities among students. Thus, external stakeholders are urging higher education institutions to reconsider their priorities and strategies by emphasising the needs of students and the broader society. HEEEs should focus on their inner environment, nurturing students and paying attention to the specific needs of students, to develop them for different careers, most importantly their chosen career. Below is an extract of an interview that relates to this notion:

Interviewee EE7, a social entrepreneur: *“These institutes should ask themselves whether they want to produce students for corporate jobs and supply employers or help students create jobs as new employers. They need to really ask who they are serving. Is it the employers and job market or it the students. My understanding is that their responsibility is students and should focus on giving the best for its students and now focus on things like how many students got employed after graduation, how quickly that*

was and pitch the highest paid jobs. Instead, they have a responsibility to expose students to different career path including entrepreneurship.”

Higher education institutions are urged to understand the difference between preparing corporate-fit employees and developing students keen to pursue an entrepreneurial career. External stakeholders find that entrepreneurs have a greater propensity for innovation as it is part of the entrepreneurial process. Creating an innovative solution that solves a problem and starting a new business is inherent in entrepreneurship. It is only one side of the coin to develop students for entrepreneurship. It is another not to foster creativity and innovation that will support the entrepreneurial journey.

When considering ‘what’ is stopping higher education institutions from developing students’ E&I capabilities, answers point mostly to the scarcity of resources. The higher education institutions that co-create and manage HEEEs suffer from two scarcities: financial resources and human resources. Both are important for the effective functioning of HEEEs. If HEEEs bridge the gap, they can attract resources from the wider entrepreneurial ecosystem including alumni entrepreneurs, other higher education institutions, financial institutions, angel investors, private companies, support professionals and even government organisations. Just as entrepreneurship education and entrepreneurial support can equip students with the relevant capabilities to master the challenges in entrepreneurship, so can resources make HEEE environments conducive to entrepreneurship. More on this is found in Chapter 9, on stakeholder engagement.

Only two out of six higher education institutions seem to have mapped institutional goals and objectives against the United Nations SDGs and commitment to entrepreneurial initiatives for their students. Higher education institutions participating in sustainable development highlight that leadership plays a more important role than governance, and stronger leadership results in more efficient outcomes from entrepreneurial initiatives (Goldstein & Glaser 2012). External stakeholders point out that more higher education institutions need to champion the integration of entrepreneurship education and entrepreneurial support in their HEEEs and empower students with capabilities in E&I. Unless higher education institutions act as catalysts with responsibility and invest in the development of their HEEEs, their value to students and society is at risk. Such a transformation might show students that higher education institutions are invested in their education needs and are valued. Thereafter, higher education institutions need to identify the composition of their HEEE that

contributes to students E&I capabilities. More on this is found Chapter 7, on the composition of HEEEs.

6.5 Chapter summary

This chapter presented the findings relevant to the first research question of this study. The findings resonate with a multi-stakeholder perspective on the development of HEEEs in a resource-constrained environment. Diverse stakeholders shared their viewpoints on the status of HEEEs in the private higher education section and how they anticipate the continued development of HEEEs. A three-level content analysis found the aggregated themes of entrepreneurial intentions, entrepreneurial mindsets and E&I capabilities. E&I capabilities is a new construct that emerged from this study. Stakeholder views on these three pathways are graphically represented in the reorder matrix in Figure 6.2, which highlights their perceived level of importance for each pathway. While student start-ups, entrepreneurial intentions and entrepreneurial mindsets are more common in HEEEs of developed countries, there was a contrasting finding on the development of HEEEs in a resource-constrained environment. In the developing context of Sri Lanka, there was a strong need for developing the E&I capabilities of students. This study suggests the key roles and contributions of HEEEs by identifying five specific roles of influential, developmental, networking, entrepreneurial and regional. Having drawn out views on the continued development of HEEEs, the chapter closes with two sections on the broader role of HEEEs bridging to their entrepreneurial ecosystem and higher education institutions as catalysts.

CHAPTER 7: FINDINGS AND ANALYSIS FOR RESEARCH QUESTION 2a

7.1 Chapter overview

This empirical chapter relates to the second set of research questions about what diverse stakeholders perceive as the contextual factors of HEEEs that could influence students E&I capabilities in a resource-constrained environment. While prior studies have garnered lists of factors for HEEEs in developed countries, such factors may work differently in a resource-constrained environment (Bedó, Erdős & Pittaway 2020). The findings from this set of research questions recognise the contextual factors for students' E&I capabilities that involves developing E&I capabilities. Higher education management can co-create and evolve their HEEEs, including the design of their learning environments, by using these factors at an institutional level. The structure of this chapter is presented in Figure 7.1.

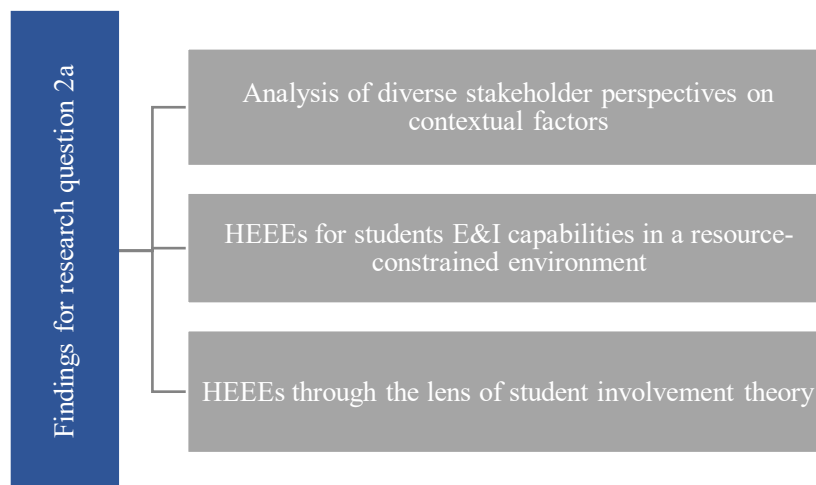


Figure 7.1 – Chapter 7 outline

Due to the increasing critique of studies resulting in a growing suite of what an ecosystem is rather than discussing how it works (Longva 2021), as an attempt for advancement, the findings addressing the second research question are analysed and presented in two parts. The first focuses on 'what' contextual factors diverse stakeholders perceive as the composition of HEEEs towards a pathway for students' E&I capabilities. The second focuses on 'how' these contextual factors translate into mechanisms in operationalising an HEEE for students' E&I capabilities and why. The following chapter is based on part one, the contextual factors, and the next chapter address the second part.

7.2 Analysis of diverse stakeholder perspectives on contextual factors

Within the two pathways identified, scholars have contributed to the composition of HEEEs by establishing the factors that impact student start-ups, and students' entrepreneurial mindset and intention (Longva 2021; Miller & Acs 2017; Rice, Feters & Greene 2014; Webber, Kitagawa & Plumridge 2020). To contribute to the evolution of HEEE composition, one of the second research questions explore contextual factors that diverse stakeholders perceive as leading to students' E&I capabilities.

The second research question involves contextual factors leading to students' E&I capabilities within HEEEs in a resource-constrained environment, through the perspective of internal and external stakeholders. In search of themes relating to research question 2a, a comprehensive content analysis was conducted. As discussed in the research design, all 40 interview transcripts were fed into NVivo to identify themes and produce an account of findings. For this analysis, a problem-to-outcome approach was taken where data was organised into three levels: (1) the prevailing problem, such as lack of institutional direction; (2) various mechanisms suggested by diverse stakeholders to address the problem, such as senior leadership, entrepreneurial culture and responsible staff; and (3) the outcome as a contextual factor, being entrepreneurial orientation. As the study investigated a resource-constrained context, Sri Lanka, it was meaningful to undertake a problem-to-outcome approach for the analysis. Interviewees spoke about problems, barriers and challenges (refer Table 7.1) related to contextual factors justifying why they made their suggestions. This content analysis involved two coding levels that resulted in aggregated themes (Figure 7.2), which are defined for better understanding in Table 7.2.

The themes that emerge help to answer the research questions of a study (Creswell & Creswell 2018). According to Figure 7.2, six aggregated themes emerged from the 40 interviews; each theme represents a contextual factor relating to entrepreneurship literature and is discussed below. In answering the second research questions, ecosystem stakeholders perceive that HEEEs can develop students' E&I capabilities through entrepreneurial orientation, E&I education, enterprising experiences, E&I research, entrepreneurial networks and entrepreneurial support. The contextual factors are reported with excerpts from the interviews with diverse stakeholders. The qualitative data was edited to improve readability and is not reported as verbatim (Jones et al. 2015; Rasmussen & Borch 2010). In Section 7.2, a block-and-file approach was utilised to present meaningful groupings of excerpts in columns as this approach supported better clarity rather than presenting separate excerpts (Grbich 2009).

Table 7.1 – Descriptions of initial codes

Initial codes	Descriptions
Lack of institutional direction	National priorities versus organisational priorities Strategic objectives versus operations Preference on employees versus self-employment careers
Lack of business acumen	No/limited entrepreneurship courses/units More theory and less practical knowledge Standard assessments
Lack of research skills	Less emphasis on research in coursework No/limited opportunities for research projects Limited scientific knowledge as new knowledge
Lack of enterprising exposure	Less opportunities for participating in competitions Internships with multinational companies versus start-ups internships No/limited opportunities for start-up projects
Lack of connections	Less social interaction among like-minded peers interested in entrepreneurship Seek for confidence and validation from senior/alumni entrepreneurs It is not ‘what’ but ‘who’ you know outside the institution
Lack of support	Need support to develop identities as potential entrepreneurs Need resources to launch entrepreneurial initiatives No/limited support to accelerate start-ups and develop their capabilities

Table 7.2 – Descriptions of aggregated themes

Aggregated theme	Description
Entrepreneurial orientation	Entrepreneurial leadership, entrepreneurial culture and responsible staff that drive institutional efforts promoting entrepreneurship and innovation
Entrepreneurship and innovation education	Curriculum, pedagogy, and assessments that enable teaching and learning entrepreneurship and innovation for students to develop their knowledge
Enterprising experiences	Outside the classroom activities including business idea competitions, internships with start-ups and start-up projects that allow students to gain exposure
Entrepreneurship and innovation research	Various research initiatives including research-based coursework, research-based projects, and research conferences for students to improve research skills
Entrepreneurial networks	Contacts and interpersonal relations between students–students and students–external stakeholders to access and develop connections
Entrepreneurial support	Services and infrastructure including mentoring, incubators, and accelerators to support students develop capabilities and become potential entrepreneurs

RQ2a: What do diverse stakeholders perceive as the contextual factors of HEEEs that could influence students E&I capabilities in a resource-constrained environment?

RQ2b: How and why do specific contextual factors of HEEEs influence students E&I capabilities in a resource-constrained environment?

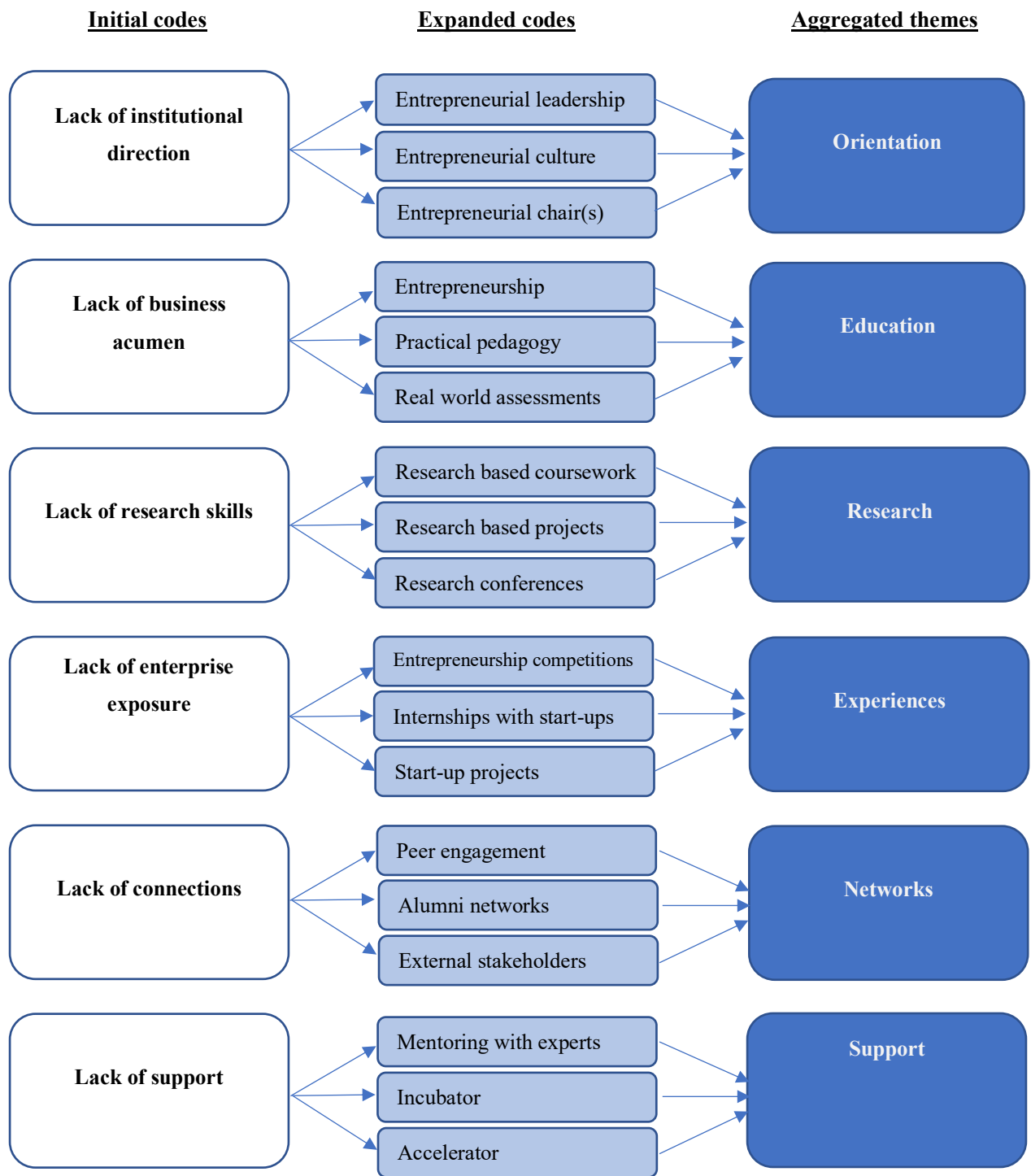


Figure 7.2 – Theme structure for research question 2

**See tables 7.1 and 7.2 above for descriptions of initial codes and aggregated themes.*

7.3 HEEE factors for students' E&I capabilities in a resource-constrained environment

7.3.1 Entrepreneurial orientation

The concept of entrepreneurial orientation refers to the configuration of processes, practices and policies that offer insights into the creation of entrepreneurial actions and decisions (Lumpkin & Dess 2015; 1996). Entrepreneurial orientation was initially associated with superior performance of an organisation (Bell 2019; Rauch et al. 2009) and entrepreneurial orientation continues to be useful in the strategic orientation of organisations (Lumpkin & Pidduck 2021). In this case, entrepreneurial orientation influences the management driving the organisation towards entrepreneurship (Poon et al. 2006; Dess & Lumpkin 2005).

Most of the stakeholders observed that higher education institutions lack institutional direction and development towards entrepreneurship. Academics/educators pointed out the need for senior leadership to promote entrepreneurship within the institution. Some 71% of external stakeholders including established entrepreneurs, angel investors and support professionals are of the view that higher education institutions can benefit from entrepreneurial orientation by aligning better to teaching, research and entrepreneurship.

As shown in Table 7.3, both internal and external stakeholders perceive that higher education institutions need entrepreneurial orientation in co-creating HEEEs to develop students' E&I capabilities. This shared consensus leads to recognising entrepreneurial orientation as a contextual factor for HEEEs in resource-constrained environments. In this case, entrepreneurial orientation is found to be necessary for actively driving institutions in resource-constrained environments. Entrepreneurial leadership, entrepreneurial culture and entrepreneurship chair (staff) are identified as mechanisms for operationalising entrepreneurial orientation; these are discussed in the next chapter.

There have been research efforts to investigate entrepreneurial orientation in a variety of contexts, including cities (Feldman 2014; Brown & Mason 2013). Scholars such as Lumpkin and Pidduck (2021) argue that entrepreneurial orientation in new contexts must capture what it means for organisations to be entrepreneurial, and characteristics of entrepreneurial orientation may differ. Among studies such as Webber, Kitagawa and Plumridge (2020), Bell (2019) and Olotuase et al. (2018) entrepreneurial orientation has been related to entrepreneurial intention to understand what makes students more malleable to behave entrepreneurially. None of the identified HEEE studies explicitly discussed entrepreneurial orientation as a contextual

factor, except an early study that suggested senior leadership, vision and sponsorship as success factors of HEEEs in developed countries (Rice, Fettes & Greene 2014).

Table 7.3 – Excerpts on entrepreneurial orientation

<p>Interviewee AI3, an angel investor working with young entrepreneurs:</p> <p><i>“So, there’s Babson, Stanford, there’s MIT, you know, if you look at the US universities and compare with Sri Lanka. What do we lack? From my observations and experiences, we lack people from the top enforcing entrepreneurship or bringing about that change into the institute. If senior management does not value or embrace entrepreneurship, how can we expect the future generation to be aware of entrepreneurship and what entrepreneurship is about? So where do they get the knowledge from if not from the institute? For example, Babson has a focused entrepreneurial program and they have done that for a very long time. But I don’t know of many private institutions in higher education that offer entrepreneurship as a degree. There is one or two.”</i></p>	<p>Interviewee AC5, an academic teaching a career planning unit:</p> <p><i>“During their education journey, students look for people they can relate to and learn from. Of course, we are there as lecturers. I have come across a couple of students who are interested in becoming entrepreneurs. So, they look for that person they can talk to, someone who can answer their questions, give them direction and learn everything entrepreneurship. Sometimes it is not the lecturers they look for. They want to know how it is like being an entrepreneur, how to improve themselves for it and things like that.”</i></p>	<p>Interviewee PS4, an external mentor in entrepreneurship:</p> <p><i>“Especially in a country like Sri Lanka, it is not just about teaching entrepreneurship as a module or course. I believe that institutes should focus on developing that spirit, as well as that mindset, and you know, encourage an entrepreneurial culture within the student population. Of course, these shared values should come from the top and spread within the institute. This is mainly because entrepreneurship can happen at any point in their careers and life. And this is the attitude we need among students, our future youth. You know some youth today have a 9am to 5pm full time job and work on a start up from 5pm to 9pm. But this is just one instance. There are others who change gears from a full-time employee to a self-made employer after a few years of working for somebody else.”</i></p>
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7.3.2 Entrepreneurship and innovation education

Compared to general education, entrepreneurship education is focused on stimulating entrepreneurial knowledge and skills while promoting entrepreneurship as an alternative career (Verheul et al. 2001). Entrepreneurship education literature has been categorised into three types: education ‘about’, ‘for’ and ‘through’ (Caird 1990). The association between educational attainment and entrepreneurship suggests that better education increases entrepreneurial activity by strengthening entrepreneurial intentions (Poschke 2013; Martinez et al. 2010; Fayolle et al. 2006). Entrepreneurship education can develop the ability and attitude of students towards entrepreneurship (Volkman et al. 2009; Hansemark 1998). Research has established that education empowers students for an entrepreneurial career (Katz 2003; Kuratko 2003;

Meyer 2001). HEEEs as an initiative of higher education institutions being entrepreneurial are primarily focused on delivering entrepreneurship education (Rice, Feters & Greene 2014).

All stakeholders agreed that entrepreneurship education is important, however there is mixed rationale for this importance. Like entrepreneurial orientation, the importance of E&I education was heard from academics/educators more than deans/heads of schools. It may seem natural for academics/educators in entrepreneurship to validate the significance of entrepreneurship as a field of study. In contrast, alumni and established entrepreneurs recognised the need for E&I education based on prevailing insufficient business acumen and lack of relevant skills among entrepreneurs, which leads start-ups towards failure. Some 66% of external stakeholders supported the contextual factor of E&I education. They view that education lays a good foundation for students in undertaking an entrepreneurial career and becoming a potential entrepreneur.

Ecosystem stakeholders are confident that capabilities of students can be developed through E&I education. Like representatives from higher education, external stakeholders such as alumni and established entrepreneurs also consider E&I education as a factor critical for students to develop and successfully engage in entrepreneurship (refer Table 7.4). Curriculum, pedagogy and assessments emerged as mechanisms for E&I education and they are discussed with respect to how they can be operationalised within HEEEs in the next chapter.

Among the identified HEEE studies, entrepreneurship education is one of the contextual factors that is constant in each HEEE (Longva 2021; Webber, Kitagawa & Plumridge 2020; Guerrero, Urbano & Gajón 2020; Meyer et al. 2020; Shil et al. 2020; Secundo et al. 2020; Allahar & Sookram 2019; Wright, Siegel & Mustar 2017; Miller & Acs 2017; Rice, Feters & Greene 2014). In line with Longva (2021) entrepreneurship education is essential to the HEEE. Through HEEEs, higher education institutions contribute to E&I and not just entrepreneurship (Webber, Kitagawa & Plumridge 2020). This research also found the need to investigate education for E&I. This is in line with analysing entrepreneurial and innovative ecosystems as an independent phenomenon (Guerrero & Urbano 2019).

Table 7.4 – Excerpts on entrepreneurship and innovation education

<p>Interviewee EE1, a second-generation entrepreneur and co-founder of a global brand:</p> <p><i>“I’ve always looked at education, especially higher education, as ‘you learn to learn’. Education gives you the skill set, and it gives you the knowledge. For example, what they learn gives students the knowledge to structure a start-up, to structure their thoughts, to structure business plans, and it gives students a widened knowledge about the different aspects or different spectrums within a business. Most importantly, it gives students the necessary tools to keep learning, absorbing information, and present information and so on, which is integral to running a business or creating a brand.”</i></p>	<p>Interviewee AE5, an alumni entrepreneur of a start-up:</p> <p><i>“As an entrepreneur, the challenge is not coming up with a solution. The challenge is many times understanding a problem deep enough. Beyond the superficial surface level. So, for that, you must have particular knowledge and skills through the course one is taking. Now institutes must make sure students get the theoretical knowledge and more practical skills like problem solving and creative thinking from the assignments they do. This is where the real capabilities develop in my understanding.”</i></p>	<p>Interviewee AC1, an academic teaching entrepreneurship:</p> <p><i>“If you look at the nature of entrepreneurship, it involves finding an innovative solution to a particular problem. This practical thought process can be developed or supported through assessments to arrive at practical outcomes. Some assessments push students to arrive at more than a written report and be involved in doing projects. These activities support to get the so-called entrepreneurial attitude into their mind and body. From such assessments, they learn from their mistakes too.”</i></p>
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7.3.3 Entrepreneurship and innovation research

Research can be theoretical and applied across the discipline of entrepreneurship with the primary focus of dissemination of findings and access to data (Brush 2014). Higher education institutions should continue to emphasise their core activities, specifically research including theoretical and applied research, to develop students’ E&I capabilities. The importance of E&I research for HEEEs was less common among internal stakeholders with just a 20% representation. In contrast, external stakeholders highlighted applying research among start-ups and developing research skills as a distinguishing capability for potential entrepreneurs. Stronger views of E&I research as a contextual factor HEEEs were from alumni and established entrepreneurs. For instance, interviewee SP3, a support professional who is an external mentor in entrepreneurship, commented:

“Research is very very crucial in entrepreneurship. Because information and data are key. Back in the day, we have heard about gut-feeling in taking decisions. But things have changed, and anything related to the product, market, competitors, environment and especially a new start-up is research driven. I have seen start-ups fail when they are built on poor research, especially market research. So, it’s an important skill in planning, launching, and managing a start-up. Even coming up with innovative solution

is linked to research. I would say research skills is among the top five skills for a successful entrepreneur. For student entrepreneurs, research is the starting point of their start-up.”

To successfully develop students' E&I capabilities, a research experience is deemed essential by practitioners. Excerpts in Table 7.5 demonstrate the core intuition among academic and non-academic stakeholders, crediting the importance of using new knowledge in their start-up and fostering the ability to research among students. Research may benefit students at various points during their entrepreneurial journey right from the beginning of a start-up through its commercialisation to its development. From this, E&I research is revealed as an HEEE contextual factor. Interviewees suggested research in terms of research-based coursework, research conferences and research-based projects within HEEEs. The three mechanisms for E&I research are further discussed relating to operationalising HEEEs in the following chapter.

In the late 19th century, an academic revolution introduced research into the university mission, adding to the primary responsibility of teaching (Etzkowitz & Leydesdorff 2000). In relation to entrepreneurship, research involves testing the hypothesised truth and arriving at new knowledge to support decisions for entrepreneurs (Brush 2014). US campuses operate in open and resource-rich environments where research is an asset providing impactful outcomes and research collaborations are instrumental to reputation and engagement to the outside world (Miller & Acs 2017). A strong ecosystem requires resources for research to develop the entrepreneurial knowledge and skills of students (Mason & Brown 2014). Leading research-driven institutions are behind the stories of successful ventures such as Google and Yahoo from Stanford and Facebook from Harvard, where the understanding is that research is a key resource for potential entrepreneurs (Walter et al. 2013).

Table 7.5 – Excerpts on entrepreneurship and innovation research

<p>Interviewee AE1, an alumni entrepreneur with tech start-ups: <i>“Research plays a major role in entrepreneurship. Even though I come from a tech background and my start-ups are technology based. I have had to drive in information about everything. Unfortunately, I wish I was more competent in research through my education as I feel I am still developing my research skills. Students nowadays should do research through their assignments and participate in research events. Because when you are an entrepreneur, you need to know everything related to your business functions, industry trends, everyday challenges, and even what’s happening internationally. That’s what improves your knowledge and understanding to run the show when one is in this entrepreneurship game.”</i></p>	<p>Interviewee DH5, a chief academic officer: <i>“When I joined this institute, they had an annual research conference for all schools to participate, students and staff. We have an entrepreneurship theme for the conference. For this, students present posters of their research from their dissertation or business project and winners are selected by external judges. I remember there was a student who did her research dissertation on entrepreneurial intention among undergraduates, and she was keen to understand the increasing trend in this new career path. So, such attempts are driven by their future behaviour.”</i></p>	<p>Interviewee SP4, an external mentor in entrepreneurship: <i>“At the end of a degree, a student has done three-four years of coursework. Students can learn more when the coursework is linked with the real world and requires them to use research to to attempt the coursework. Like when mini cases are used to set the scene but to actually answer the questions students need to do their own research. I believe this is a way to inbuild research into their learning, so students develop that research-based attitude by searching and using information for managing a start-up. This is for entrepreneurship related units but not just for these. Be it management, marketing or finance, it is still important for student to know how to attempt real world problems.”</i></p>
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While some scholars argue that students engaged in research are more likely to possess superior knowledge and skills to identify opportunities and develop ideas (Ucbasaran et al. 2008; Arenius & De Clercq 2005), there is a view that the impact of entrepreneurship research on such students is limited (Neck et al. 2011). Among the 10 identified HEEE studies, research is only suggested as a contextual factor in the study by Miller and Acs (2017), alongside factors such as education and extracurricular activities. In this study, external stakeholders pointed out that students can learn and develop from research and knowledge, scientific and practical, should not be discounted in the HEEE. This emphasis is based on the view that lack of market research skills is one of the key reasons why start-ups fail in Sri Lanka, especially in the first two years of inception.

Compared to internal stakeholders who did not express the importance of research within the HEEE strongly, external stakeholders related experiences that highlighted the need for start-up founders to be data driven and empowered with research skills. Angel investors and support professionals including mentors indicated that some start-up founders have made less consideration of the customer and their need for the product due to lack of market research.

This led to a major shortcoming where such start-ups are not solving a problem in the market and suffer from not being able to attract customers for the new business. Often, founders who failed in their start-up addressed problems that are interesting to solve with a market offering or based a start-up on their capabilities and passion rather than serving a market need. These external stakeholders claim that start-up founders spend the least amount of time exploring the market and understanding unmet customer needs as doing research does not seem to be part of their system. Alumni and established entrepreneurs argued that secondary market research in Sri Lanka is limited or almost non-existent and conducting primary research is expensive.

7.3.4 Enterprise experiences

Enterprise experiences relate to undertaking various projects including volunteering and internships (Webber, Kitagawa & Plumridge 2020) and this study shows mixed results for this contextual factor. While extracurricular activities are popular among higher education institutions, internal stakeholders hold a moderate view of enterprise experiences. In Sri Lanka, lack of exposure to enterprise experience is a pressing concern according to external stakeholders. They suggest that HEEEs should offer enterprise experiences and not merely co-curricular and extracurricular activities that enrich student learning experiences. Some 74% of external stakeholders highlighted the factor of enterprise experiences, with alumni and established entrepreneurs advocating strong opinions. Unlike co-curricular and extracurricular activities, the focus of enterprise experiences that emerged in this study is specific to entrepreneurship. These activities take students to the broader environment and make enterprise experiences a strong pillar of HEEEs that enable students to acquire practical applications of entrepreneurship in real or almost real situations.

Activities outside the classroom are opportunities for enterprise experiences, allowing students to engage in collective learning where they can learn from the wider community. Table 7.6 presents snippets from interviews where multiple stakeholders express the value of enterprise experiences. Engaging in enterprise activities not only helps students to start thinking about what interests them and what their strengths are but to apply their knowledge in practical situations and learn from those experiences. Thus, enterprise experiences are perceived as a contributing factor of HEEEs by diverse stakeholders. Higher education institutions should create opportunities for students to reach beyond the institution to engage with industry and entrepreneurial communities.

Most of the HEEE studies identified in this study include various activities representing enterprise experiences (Longva 2021; Webber, Kitagawa & Plumridge 2020; Shil et al. 2020; Secundo et al. 2020; Meyer et al. 2020; Miller & Acs 2017; Wright, Siegel & Mustar 2017; Rice, Fetters & Greene 2014). In HEEE literature, enterprise activities including business plan competitions (Shil et al. 2020; Secundo et al. 2020; Meyer et al. 2020; Miller & Acs 2017; Wright, Siegel & Mustar 2017; Rice, Fetters & Greene 2014), volunteering (Webber, Kitagawa & Plumridge 2020), work experiences or internships (Shil et al. 2020; Meyer et al. 2020; Webber, Kitagawa & Plumridge 2020; Miller & Acs 2017) and start-up projects (Longva 2021; Secundo et al. 2020; Wright, Siegel & Mustar 2017) have been found to affect start-ups and entrepreneurial intention. While volunteering did not strongly emerge from this study, entrepreneurship-related competitions (business idea, venture), internships with a start-up and start-up projects are common mechanisms that stakeholders suggest for students to gain a valuable enterprise experience helping them develop capabilities for E&I through the HEEE. These three mechanisms for enterprising experiences within HEEEs are further discussed in the next chapter.

Table 7.6 – Excerpts on enterprising activities

<p>Interviewee EE5, an entrepreneur of a fashion start-up:</p> <p><i>“During their education students should have access to competitions. They will get more confidence, meet new people, and network and even get inspired. When they compete, they become independent and resilient preparing them for future situations. I can say that competitions were helpful in my experiences. For me, such competitions makes students aware of the knowledge they need to bring a start-up together. But I don’t see much of it being organised.”</i></p>	<p>Interviewee EE4, an award-winning entrepreneur:</p> <p><i>“Institutes should put students into the real-life situations like internships to work for entrepreneurs and start-ups where they have to do things and learn by doing. This is where students will understand their limitations and recognise their skills. If they sit in a classroom, listen to a lecture and do an activity they will not necessarily discover their strengths and weaknesses because they are not facing real life situations.”</i></p>	<p>Interviewee AE4, an award-winning social entrepreneur:</p> <p><i>“Yeah, young students need personality building sort of experiences. In addition to teambuilding, I feel we lack the confidence to go out there and you know, pitch an idea, you know, just you have the drive as an entrepreneur, they’re afraid to even ask a question. Right? So, we are very backward compared to other cultures. Participating in mini projects can break these barriers and develop the right attitude among students, especially if they get involved during higher education.”</i></p>
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Enterprise experiences such as business competitions are an enduring enabler for students (Morris & Pryor 2013). For example, the University of Chicago launched the New Venture Challenge, a business competition for students, with a vision to encourage students to

learn about entrepreneurship and acquire a skill set from their experience. In two years since its inception, the business competition has attracted such significant entrepreneurial interest that it needed to take a much larger form, prompting the entrepreneurship centre (Miller & Zoltan 2017). Giving students a meaningful opportunity to practise and experience is critical to encouraging interest in entrepreneurship (Barr et al. 2009) and creating enthusiasm within the ecosystem (Fetters, Greene & Rice 2010).

7.3.5 Entrepreneurial networks

Both groups of internal and external stakeholders expressed the important influence of entrepreneurial networks in capability development. There was a high level of recognition in entrepreneurial networks among internal and external stakeholders. Deans/heads of school and academics/educators acknowledge the importance of entrepreneurial networks for students to pursue a career in entrepreneurship and develop necessary capabilities. Almost 70% of external stakeholders, alumni entrepreneurs and angel investors perceive that students lack connections beneficial for their entrepreneurial career. They explained that entrepreneurial networks enable students to become a part of an entrepreneurial community and see themselves as potential entrepreneurs.

Entrepreneurial networks contribute to entrepreneurial capabilities including human, financial and technical capacities (Jack, Doff & Anderson 2008). Such networks not only offer students opportunities to build connections and relationships with peers, alumni and other stakeholders but also the leverage they need for entrepreneurship. The excerpts in Table 7.7 indicate how these networks and relationships contribute to student's E&I capabilities through internal and external stakeholders. Ecosystem stakeholders identify entrepreneurial networks as a contextual factor of HEEEs where entrepreneurial networks inspire, facilitate and promote entrepreneurship while engaging students with other stakeholders. Interviewees from this study suggest entrepreneurial networks in the form of peer engagement, alumni networks and access to external stakeholders; these are further discussed in the next chapter, on operationalising networks in HEEEs.

Entrepreneurs are a result of their social environment (Anderson & Miller 2003). When in the presence of successful and experienced entrepreneurs, the community, including students, receive inspiration for entrepreneurship as a career option, and the absence of such connections discourages new venture creation (Gnyawali & Fogel 1994). Interviewee EE4, an

award-winning entrepreneur, commented on how entrepreneurial networks among students, alumni and external stakeholders influence students for entrepreneurship:

“During my higher education, we didn’t have clubs or communities but outside the institute, I was a member of the Model United Nations Future World Leaders Summit. Up to date, I am still connected to many people I got to know and use those relationships and the friendships that I built for the benefit of my business. If we network, all these people come up in life. Especially in Sri Lanka, everybody knows each other. It’s not about what you know, it’s whom you know, in our part of the world because the systems are not in place properly and resources are not widely available. Because of this, these networks, interactions and relationships give budding entrepreneurs the leverage.”

Table 7.7 – Excerpts on entrepreneurial networks

<p>Interviewee AC3, an academic teaching an entrepreneurship-related unit:</p> <p><i>“Currently, we have all one-off events where an entrepreneur will come for a talk, share his or her entrepreneurial story, take questions from students and leave inspiring the students. But this is not enough so we created an entrepreneurial club among current students. We believe it is useful to connect aspiring students, peers from various fields of study, network on a going basis and build a supportive community of potential entrepreneurs. This way they meet regularly, share knowledge, and produce outcomes a club and individuals. Such a networking arrangement facilitates ‘learning by doing’ taking students beyond aspiration and equipping them with practical knowledge to launch a start-up at some stage.”</i></p>	<p>Interviewee SP5, an external mentor in entrepreneurship:</p> <p><i>“Networking is an essential part of entrepreneurship and entrepreneurial networks with people outside the institute have various benefits for students. Students can talk about ideas and validate their business. Even ask the ‘how’ questions from people who have successfully started ventures or assisted in the process. There are other benefits also like tips and tricks, training opportunities, research and more. These can impact a students’ behaviour and not mere intention. One may even meet potential partners, investors and mentors through external networks. I have actually learnt a great deal and benefited from my networks. Your network becomes your social capital.”</i></p>	<p>Interviewee EE3, a second generation entrepreneur:</p> <p><i>“Education is not just about going to university and learning the theory of some subject. But the exposure which is way beyond. Meeting people from the outside world, interacting with them, getting to know about the society, people’s behaviour, lifestyles and learning about environments. It’s really important for students to learn about the society and learn from the broader community. This Is the kind of social learning and attitude that students should receive to prepare themselves for something as entrepreneurship.”</i></p>
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Networks offer higher education institutions the ability to collaborate with stakeholders including industry, government and others in the external environment (Yi & Uyerra 2018; Hayter 2013; Anderson & Jack 2010). The dynamic interconnectivity of stakeholders within

the ecosystem is argued to add energy to the development process of students (Wraae & Thomsen 2019; Kolb & Kolb 2005). When learning, the entrepreneur experiences, reflects and theorises and their thoughts have a ‘social character’ (Pavlica et al. 1998). This contrasts to learning approaches such as by Kolb (1984) that view the learner as ‘an intellectual Robinson Crusoe’ isolated from fellow beings. Since then, research has begun to acknowledge the influence of entrepreneurial networks in knowledge development and transfers in entrepreneurial learning and network-centred learning (Collinson & Shaw 2001). Therefore, an integral building block of the education process is the complex network of relationships including various ecosystem stakeholders such as alumni, entrepreneurs and more (Taylor & Thorpe 2004).

Most of the HEEE studies identified various forms of entrepreneurial networks (Longva 2021; Meyer et al. 2020; Shil et al. 2020; Secundo et al. 2020; Allahar & Sookram 2019; Wright, Siegel & Mustar 2017; Miller & Acs 2017). In the HEEE study by Longva (2021), it was suggested that students develop their social contacts and ties within the HEEE during their education journey. Her study showed that students access professional knowledge and advice through social networks with peers and faculty. This is consistent with literature that demonstrates that access to information is a key benefit of a well-developed network (Elfring & Hulsink 2003; Jenssen & Koenig 2002). Further, students tend to develop their identities and build self-confidence through their networks in the HEEE they are engaged in (Longva 2021). The development of a framework related to entrepreneurial learning would require and benefit from relevant networks (Taylor & Thorpe 2004).

7.3.6 Entrepreneurial support

Entrepreneurial support positively impacts on developing student E&I capabilities that have the potential to lead to entrepreneurship (Lichtenstein & Lyons 2001). Entrepreneurial support involves supporting students to start and scale their business through advice, training and resources (Hruskova & Mason 2020). Entrepreneurial support recognises the challenges that entrepreneurs face in the entrepreneurial process and any lack of skills and resources (Spigel 2016). The help offered by entrepreneurial support organisations goes beyond the traditional perspective that includes professional services offered for business development, accounting, law and compliance (Feldman 2001).

As with E&I education, all 10 identified HEEE studies included different forms of entrepreneurial support in the proposed HEEEs (Longva 2021; Webber, Kitagawa & Plumridge

2020; Guerrero, Urbano & Gajón 2020; Meyer et al. 2020; Shil et al. 2020; Secundo et al. 2020; Allahar & Sookram 2019; Wright, Siegel & Mustar 2017; Miller & Acs 2017; Rice, Fetters & Greene 2014). There was an almost 40% representation for entrepreneurial support among internal stakeholders and 60% from external stakeholders. Deans/heads hold the view that entrepreneurial support is important; however, they expressed that their institutions require external support from individuals, organisations and the government to provide support services for their students. With the lack of support currently available, external stakeholders including alumni entrepreneurs, angel investors and support professionals advocate that entrepreneurial support can leverage students as potential entrepreneurs, with their entrepreneurial ideas and careers.

While there is much emphasis on entrepreneurship education, there is more involved in supporting students towards entrepreneurship. Entrepreneurial support from individuals and organisations is a critical factor of entrepreneurial ecosystems in supporting entrepreneurs to start, consolidate and scale up their businesses (Hruskova & Mason 2020). Entrepreneurial support positively impacts the development of entrepreneurial capabilities among students (Lichtenstein & Lyons 2001). These support services are a valuable addition that higher education institutions can provide through their HEEEs to leverage entrepreneurial ideas and the careers of students. Interviewee SP4, an external mentor in entrepreneurship, shared:

“I’m a firm believer in mentoring, coaching, incubators, accelerators and so forth. Creating support services for students is helpful and required especially in developing countries. I think private institutions have a huge responsibility to create these platforms and provide students that support. This is the support; institutes should offer their students to really develop for entrepreneurship, engage in entrepreneurship and get their hands dirty.”

Many interviewees advocated that entrepreneurial support could develop students for a self-made career in becoming entrepreneurs. Table 7.8 reveals some excerpts about how entrepreneurial support can encourage students’ entrepreneurial ideas and intentions for the creation and growth of start-ups through E&I capabilities. In these views, there is entrepreneurial support that higher education institutions can offer. Interviews from this research suggest entrepreneurial support includes mentoring with an entrepreneurship expert, incubators and accelerators; these mechanisms are discussed in the next chapter, on how to implement HEEEs in resource-constrained environments.

A study on an institutional support system confirmed that entrepreneurial support has a positive effect on the entrepreneurial intention of students (Bazan 2018). Similar to E&I education, all 10 identified HEEE studies include different forms of entrepreneurial support in the proposed HEEEs (Longva 2021; Webber, Kitagawa & Plumridge 2020; Guerrero, Urbano & Gajón 2020; Meyer et al. 2020; Shil et al. 2020; Secundo et al. 2020; Allahar & Sookram 2019; Wright, Siegel & Mustar 2017; Miller & Acs 2017; Rice, Fetters & Greene 2014). This use of entrepreneurial support is consistent with the observation made in the literature review that HEEEs are a nexus of entrepreneurship education and entrepreneurial support. Scholars including O’Brien, Cooney and Blenker (2019) argue that entrepreneurship education on its own does not offer students the full potential towards E&I including developing capabilities.

Table 7.8 – Excerpts on entrepreneurial support

<p>Interviewee PS1, an external mentor and coach: <i>“You see accelerator programs gives students expert advice. Whether it’s on business pitching, lean models, managing teams, attracting resources and others. Students who get this knowledge and experience have the ability to improve their scalable start-ups, ideas and concepts to market-ready product and services with more successful start-ups.”</i></p>	<p>Interviewee DH5, a chief academic officer: <i>“Large investment has taken place over the last few years for our incubator centre. We have a massive space with all the infrastructure, probably the largest in the private higher education sector. After the graduation, students can work in the facility, create prototypes, and test them. Engineering students work on such projects with a staff member’s supervision. The idea behind is to push their behaviour towards entrepreneurial initiatives. So, this is in addition to the co-working space which is available for them to run their office during the early days. There is a reception that handles all administration work for them. It is a great deal of support with a full range of services for them at almost no cost.”</i></p>	<p>Interviewee AE2, an alumni entrepreneur: <i>“Our institutes had mentoring by academics but they did touch upon professional development and stuff, but not much practically related to careers during my time. To make things more hands-on, mentoring should be organised as one to one or in small batches of students. These should be mentors who can share expert knowledge. Mentors can open discussion to get students thinking and students can ask questions to get their thoughts and ideas off ground. So that students develop a more practical attitude and become aware of hands-on things.”</i></p>
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In summary, six contextual factors of HEEEs for students’ E&I capabilities in a resource-constrained environment came to light through this research. After reporting the findings above, these six contextual factors are compared to the HEEE literature. According to Table 7.9 below, it is evident that extant HEEE studies have investigated some contextual factors towards intentions, mindset and start-ups. Briefly, the most common are mechanisms of entrepreneurship education and entrepreneurial support and the least popular are

mechanisms of entrepreneurial orientation and entrepreneurial research. The majority of HEEE studies have suggested HEEEs include mechanisms of entrepreneurship education, enterprise experiences, entrepreneurial networks and entrepreneurial support. However, none of the existing studies investigated or proposed a comprehensive model including all six contextual factors in HEEEs for students' E&I capabilities in a resource-constrained environment. This study proposes an HEEE model including the six contextual factors through multiple views of internal and external stakeholders: (1) entrepreneurial orientation; (2) E&I education; (3) E&I research; (4) enterprise experiences; (5) entrepreneurial networks; and (6) entrepreneurial support.

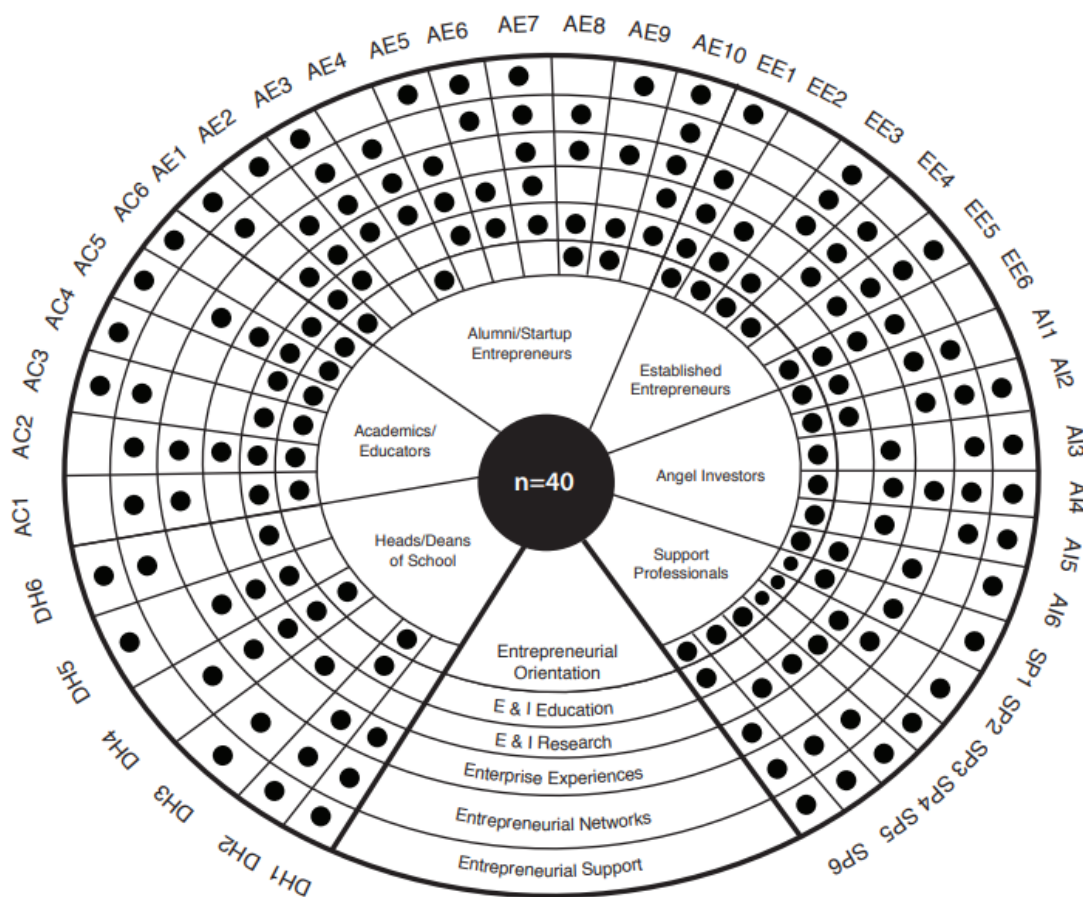
Table 7.9 – Mapping HEEE factors of existing studies to this research

HEEE studies	Focus of HEEE	Entrepreneurial orientation	Entrepreneurship and innovation education	Entrepreneurship and innovation research	Enterprise experiences	Entrepreneurial networks	Entrepreneurial support
Longva (2021)	Student start-ups		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Webber, Kitagawa & Plumridge (2020)	Students' intention		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Guerrero, Urbano & Gajón (2020)	Students' intention		<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>
Meyer et al. (2020)	Student start-ups		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Shil et al. (2020)	Student start-ups		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Secundo et al. (2020)	Students' mindset		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Allahar & Sookram (2019)	Student start-ups		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Wright, Siegel & Mustar (2017)	Student start-ups		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Miller & Acs (2017)	Student start-ups		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Rice, Fetters & Greene (2014)	Student start-ups	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>

*Note – The above 10 HEEE studies have not explicitly identified the six contextual factors but rather some mechanisms that represent these factors. For example, Rice, Fetters and Greene (2014) identify senior leadership, which in this study is a mechanism of entrepreneurial orientation.

7.4 Perceived importance of HEEE factors

Following the discussion of the aggregated themes, which are presented as contextual factors, it is important to quantitatively summarise the findings, a process which makes qualitative research more creditable (Silverman 2022). The above section suggested that diverse stakeholders perceive *entrepreneurial orientation*, *entrepreneurship and innovation education*, *enterprising experiences*, *entrepreneurship and innovation research*, *entrepreneurial networks* and *entrepreneurial support* as contextual factors that lead to the pathway of developing students' E&I capabilities in a resource-constrained environment. To summarise the data, a spectrum display is used to identify the factors that each stakeholder discussed in their respective interview (Henderson & Segal 2013). The spectrum display visualises qualitative data at the aggregated theme level associated with the level of importance (Slone 2009).



DH Dean/Head of School and AC Academic/Educator, AE Alumni entrepreneur, EE Established entrepreneur, AI Angel investor and SP Support professional

Each • (dot) is identified as a point

Figure 7.3 – Importance of contextual factors as perceived by diverse stakeholders

The spectrum display in Figure 7.3 shows a summary of data collected during the interviews on how internal and external stakeholders perceive HEEE composition, specifically contextual factors. The outer labels DH1 to SP6 represent the 40 participants of the study from six different stakeholder groups. The six layers of the display stand for the six contextual factors that emerged through the study. Each dot in the display articulates that a specific participant indicates the contextual factor as important for developing students' E&I capabilities. Both groups of stakeholders, internal and external, recognised all six contextual factors and their mixed views on the six contextual factors were discussed above.

In total, the six contextual factors appear equally important, with 29, 27, 25, 27, 26 and 31 points, respectively. Entrepreneurial support (31) is the contextual factor with the greatest number of points indicating the highest importance, followed by entrepreneurial orientation (29). Internal and external stakeholders perceive that students can benefit from engaging with the broader environment and develop their E&I capabilities better with additional support from outside the institution. However, external stakeholders, specifically angel investors and support professionals, point out that for this collaboration to happen effectively, higher education institutions need to embrace entrepreneurship, make it a strategic choice and drive it actively internally through their HEEE. All six academics that participated in this study emphasised the same, sharing that their institutions can improve from being more entrepreneurial. However, more than half of the alumni entrepreneurs did not indicate the importance of entrepreneurial orientation for HEEEs. To some extent, alumni entrepreneurs believe that students organically develop HEEEs as getting top management to drive entrepreneurship is less likely.

When comparing the two dominant functions of HEEEs, entrepreneurial support (31) ranks as more important than E&I education (27). This trend could be because some of the external stakeholders including angel investors and support professionals are of the view that students can gain practical knowledge and skills from non-formal education such as receiving one-to-one mentorship, participating in an incubator and accelerator program. Students are perceived to develop deeper E&I capabilities by sharing dialogue with experts on validating business ideas, creating prototypes in facilities and meeting like-minded peers, rather than learning in classrooms. Guidance from expert entrepreneurs and support professional along with supporting infrastructure are factors that enable start-ups to succeed in the resource-constrained environments. However, the external stakeholders agree that potential entrepreneurs benefit from entrepreneurship and innovation education that gives them the foundations.

Internal and external stakeholders broadly recognise E&I education as an important contextual factor within HEEEs. Internal stakeholders, particularly academics naturally give importance to their service of imparting knowledge and as a result perceive the need for entrepreneurship education. Further, these academics lack formal education and exposure in entrepreneurship and perceive the need for potential entrepreneurs to receive it. External stakeholders expressed stimulating entrepreneurial knowledge and skills as essential for young entrepreneurs to understand the uniqueness of start-ups, compared to other forms of business. E&I education lays a strong foundation for students in undertaking an entrepreneurial career and becoming a potential entrepreneur, like any other profession.

E&I education and enterprise experience are rated equally important with 27 points. Although it is the same degree of importance for both contextual factors, mixed view are shared by different stakeholders. Majority of internal and external stakeholders are of the opinion that E&I education and enterprise experience are equally important (14). Some internal and external stakeholders believe only E&I education is more important (11) and only two stakeholders highlighted enterprise experience (1 – internal, 1 – external). The consensus is that both, education and exposure is essential for developing student's E&I capabilities within the HEEE in a resource-constrained environment. The common perception held is that education on its own is inadequate for E&I capabilities as students need the opportunity to apply what they learn and develop from successful and unsuccessful experiences. Stakeholders also noted that some students might come from entrepreneurial families and already have some level of capability through a sound background from childhood.

Internal and external stakeholders express that entrepreneurial network (26) is salient for HEEEs and leads to E&I capabilities. The understanding is that students should have the opportunity to engage with a combination of stakeholders, inside and outside the higher education institutions, to develop for entrepreneurship and innovation. Students not only develop E&I capabilities through entrepreneurial networks but also build their resource repository by engaging with various stakeholder that promote and support entrepreneurship. Further, such networking opportunities allow students to build social capital which increases their likelihood of becoming an entrepreneur and advancing the entrepreneurial process. However, social networks of HEEEs are still in early stages of development in this resource-constrained environment and most networking is ad hoc interactions, which are less impactful on students E&I capabilities.

The least common contextual factor is identified as entrepreneurship and innovation research (25). However, a little over 60% of the participants strongly emphasised the importance of research skills for potential entrepreneurs. More than internal stakeholders of institutions, external stakeholders hold the importance of E&I research linking it to their experiences with entrepreneurs. Angel investors and support professionals highlight that start-ups tend to suffer from insufficient market research due to lack of research skills among entrepreneurs. Such start-ups are more likely to fail in solving a market problem and serving a market need. Primary research is rarely commissioned to support decision making and second research is not readily available. External stakeholders emphasised that potential entrepreneurs need to understand the importance of data-driven decision-making, to maintain sustainability and avoid basing business decisions on emotions and passion only.

In the end, there should be no factor limiting a student's ability to pursue an entrepreneurial career. Knowledge in entrepreneurship and innovation, an enterprising skillset, entrepreneurial community and continuous support, are key for student E&I capabilities.

7.5 HEEEs through the lens of student involvement theory

According to the psychologist Bronfenbrenner (1979), the most immediate and influential environment affecting an individual are the activities they are engaged in. Active involvement in or even exposure to such activities can inspire one to undertake similar experiences or develop one's capabilities (Bronfenbrenner 1979). The importance is that student development involves a change and can change what an individual feels, thinks and does (Bronfenbrenner 1979). This principle applies to higher education institutions and stakeholders involved in developing students through HEEEs. Considering the HEEE through the lens of student involvement theory places the HEEE in the middle of the model, replacing environment with the HEEE. Figure 7.4 shows that the HEEE behaves as the environment of a higher education institution. Students are involved and experience higher education during their undergraduate degree, leading to the desired outcome.

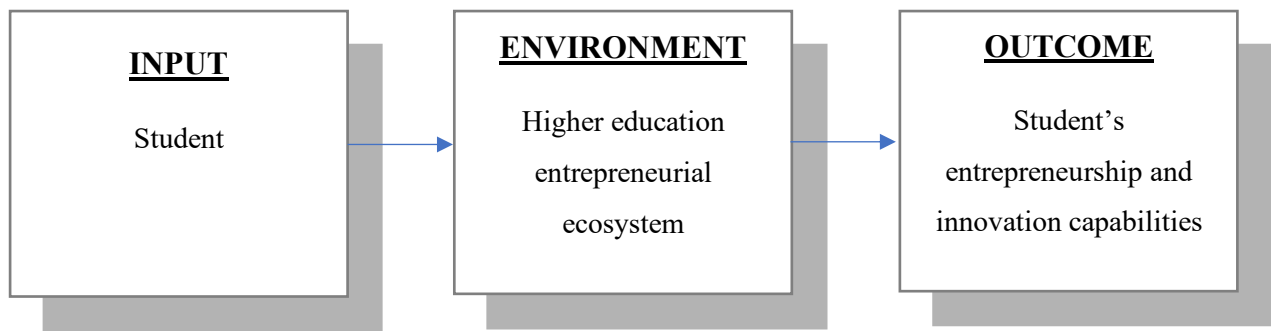


Figure 7.4 – HEEE adapted to student involvement theory

Adapted from Astin (1999)

The student involvement theory helps us to understand how the HEEE acts as the environment and the efforts of higher education institutions can translate into student development (Astin 1999). The HEEE of a higher education institution can be analysed through the five postulates of student involvement theory: (1) student invests psychological and physical energy; (2) student is involved in activities continuously; (3) student involvement can be quantitative or qualitative; (4) student development is proportionate to student involvement; and (5) student involvement relates to the effectiveness of environment activities (Astin 1999). The last two propositions are salient to co-creating effective HEEEs for students and are subject to empirical evidence from the specific higher education institution (Astin 1999).

7.5.1 Student invests psychological and physical energy

The first proposition of the student involvement theory is that a highly involved student devotes psychological and physical energy to studying, taking part in activities, undertaking tasks, and interacting with peers, academics and others in the higher education environment (Astin 1999). This proposition is illustrative of student involvement and there can be many forms of participation in an HEEE. Through this study, management of higher education institutions are exposed to six contextual factors (entrepreneurial orientation, E&I education, E&I research, enterprising experiences, entrepreneurial networks, and entrepreneurial support) that impact students' E&I capabilities within an HEEE in a resource-constrained environment (refer Figure 7.2). The operationalisation of these factors in HEEEs can benefit from collaboration of stakeholders from the wider entrepreneurial ecosystem.

Higher education institutions can offer opportunities for students to invest their energy in highly generalised activities such as entrepreneurship-oriented lectures and highly specialised activities such as an internship with a start-up or mentoring by an entrepreneurship

expert. These activities can vary according to student preferences and participation and should be regularly evaluated. Students should have access to various activities to engage and invest their psychological and physical energy in during their higher education.

7.5.2 Student is involved in activities continuously

The second proposition of the student involvement theory is that a student commits to activities along a continuum (Astin 1999). External stakeholders such as alumni and established entrepreneurs perceive that students should be involved in entrepreneurship-related activities from the first year of their undergraduate studies. This means students should have opportunities to be involved in new and ongoing activities during their studies. In terms of specialised learning, most higher education institutions do not offer entrepreneurship undergraduate degrees in Sri Lanka due to the low demand for it in terms of student numbers. In such a situation, students should have the ability to take elective units in entrepreneurship within their undergraduate degree. A dean from a higher education institution stated that their business management students can take an entrepreneurship-related unit every year as an elective during the three-year degree. However, this was evident in only one of the six institutions. Educational programs with entrepreneurship electives within the HEEE may attract more students and even contribute to higher levels of self-employment. In response to the increasing interest in entrepreneurship among students, higher education institutions can consider offering minors or graduate certificates in entrepreneurship.

As for activities outside the classroom, it is the view of external stakeholders that higher education institutions should provide various activities, namely internships with start-ups, mentoring programs with experts, research-based projects and start-up projects, to move students from receiving inspiration to developing capabilities. Any activity should be relevant to the student in the degree and should have continuity for the student to engage during the whole higher education timeline. Using the contextual factors discussed in Section 7.2, higher education institutions can design and develop their HEEEs for continuous involvement. Within the continuum of activities, stakeholders from the wider entrepreneurial ecosystem can engage and play different roles that range from inspiring entrepreneurship to providing expert feedback. However, institutions must understand that students may hold different degrees of involvement in each activity. This highlights the need for higher education institutions to continuously observe student participation in the respective HEEE.

7.5.3 Student involvement can be quantitative and qualitative

The third proposition of student involvement theory is that student involvement in an activity can be measured quantitatively or qualitatively (Astin 1999). This means that quantitative or qualitative measures can evaluate student involvement in various activities within HEEEs. The number of hours a student partakes in a start-up project is a quantitative measure of student involvement. On the other hand, how well the student translates learnt theories and applies knowledge in a start-up project is more qualitative. While internal stakeholders emphasised the number of activities and hours that students participate, external stakeholders were keen on knowledge application. Although quantitative involvement matters, it is qualitative involvement in HEEE factors that lead to E&I capabilities. When higher education institutions co-create their HEEEs and take related decisions, it is necessary to understand that student involvement in a specific activity can be both quantitative and qualitative.

7.5.4 Student development is proportionate to student involvement

The fourth proposition of student involvement theory is that student learning and personal development are directly proportional to the quantity and quality of student involvement in the activity (Astin 1999). This condition implies that student development associated with any activity of the HEEE is related to the student's involvement in that activity. For instance, students' E&I capabilities can improve by taking up networking with external stakeholders or joining an incubator or accelerator. Both internal and external stakeholders expressed that there is a growing interest in entrepreneurship-related activities among students. If students are more engaged in activities that appeal to them, this involvement can lead to their E&I capabilities compared to being passive. In the end, increased student involvement in various activities in HEEEs can result in a higher level of E&I capabilities. Therefore, higher education institutions can increase or improve opportunities for student involvement through the institution and by exploiting the support of external stakeholders.

7.5.5 Student involvement relates to the effectiveness of activities

The final proposition of student involvement theory is that the effectiveness of any activity directly relates to the capacity of that activity to increase student involvement (Astin 1999). This proposition suggests that student involvement depends on the activity. The evaluation of activities within an HEEE can depend on various measures. However, the judgement of success is largely held by the students. If an activity is useful or successful, then the activity generally attracts the involvement of more students. For example, guest lectures and industry

involvement were popular initially, but now with the emergence of entrepreneurship, the focus of students is more on practical activities. While educators strongly believe in the value of entrepreneurship education, external stakeholders suggest that it establishes the foundation for an entrepreneur and students develop a variety of skills only by being involved in activities associated with enterprise experiences, entrepreneurial networks and entrepreneurial support. Entrepreneurship scholars can examine the effectiveness of various HEEE factors and their mechanisms among students or alumni entrepreneurs within a particular resource-constrained context. However, there is a caution that some activities in an HEEE are mandatory as part of higher education, while others are voluntary and based on student interests.

The above are propositions for higher education institutions to consider in co-creating and evolving HEEEs for the developmental influences in their learning environment for students. The more involved the student is in the HEEE, the greater the student's E&I capabilities will be. This shows that HEEEs, through the lens of student involvement theory, consider behavioural processes that facilitate students E&I capabilities, rather than simply focusing on the factors that enable development. It is important for higher education institutions to understand this value creation. However, value creation tools are not so common in education but represent a promise for higher education (Lackeus 2015). Among such tools, design thinking is applicable for this case, which is another field of study that could be contextualised to an education setting to support student learning and development (Lackeus 2015). Further, the need to understand the needs presented by the wider entrepreneurial ecosystem, to recognise students engaging and investing their psychological and physical energy, to continuously observe student participation and to evaluate the effectiveness of activities in HEEE is similar to the design thinking approach.

Design thinking has made its way to entrepreneurship and entrepreneurship education literature but not so much in HEEE scholarly work. Design thinking is a collective iterative process of being creative and inspired by the world, brainstorming for activities that might help and testing these activities (Brown 2008). This process involves going beyond 'what is' and 'what should be' to 'what might be' (Dunne & Martin 2006). Design thinking-led HEEEs require higher education institutions to understand their customers (students and parents) and the society (wider entrepreneurial ecosystem), collaborate with stakeholders that play an important role in the process and continuously improve. Designing HEEEs using design thinking resonates with a student-centred approach for understanding their needs and refining the learning processes, similar to developing entrepreneurial pedagogy (Huq & Gilbert 2017).

Higher education institutions can design their HEEEs along with stakeholders from the wider entrepreneurial environment as this may develop the resourcefulness they lack.

7.6 Chapter summary

This chapter analysed and presented one part of the findings associated with the second research question that focused on ‘what’ contextual factors of an HEEE can develop students’ E&I capabilities, through multi-stakeholder perspectives. A content analysis was conducted for this question that took a problem-to-outcome approach identifying common codes and themes. This section is one of the first empirical steps to present findings on HEEEs for students’ E&I capabilities in a resource-constrained environment. This study proposes six contextual factors through multiple views of internal and external stakeholders: (1) entrepreneurial orientation; (2) E&I education; (3) E&I research; (4) enterprising experiences; (5) entrepreneurial networks; and (6) entrepreneurial support. After reporting the findings, this chapter encompassed a section discussing HEEEs through the lens of student involvement theory. The second part of the findings is presented in the next chapter emphasising the operationalising HEEEs for students E&I capabilities.

CHAPTER 8: FINDINGS AND ANALYSIS FOR RESEARCH QUESTION 2b

8.1 Chapter overview

This empirical chapter is a continuation of the findings and analysis for the second set of research questions. Having understood ‘what’ contextual factors diverse stakeholders perceive as the composition of HEEEs towards students’ E&I capabilities, this chapter extends to ‘how’ and ‘why’. This chapter presents and discusses findings related to how and why specific contextual factors of HEEEs influence students’ E&I capabilities in a resource-constrained environment.

A critical challenge in co-creating HEEEs is that many factors of a successful HEEE in a resource-constrained environment would have gaps in such contexts (Bedő, Erdős & Pittaway 2020). According to the perceptions of the internal and external stakeholders interviewed in this research, there are several gaps within HEEEs that challenge higher education institutions to function effectively. To advance our understanding, this chapter goes beyond ‘what’ contextual factors presented in Chapter 7 to reporting ‘how’ and ‘why’. Therefore, the next section directs higher education institutions to concerted efforts in developing E&I capabilities of students within HEEEs. The chapter outline is shown in Figure 8.1.

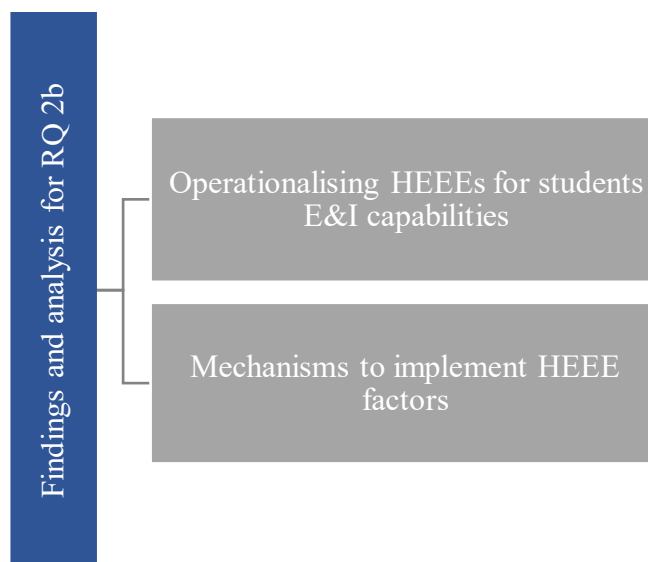


Figure 8.1 – Chapter 8 outline

8.2 Operationalising HEEEs for students' E&I capabilities

There is an increasing critique in the emerging HEEE literature that it is producing lists of 'what' an HEEE is over explanations of 'how' an HEEE can be implemented (Longva 2021). There is little consensus and clarity regarding which specific actions can support higher education institutions in implementing contextual factors within an HEEE in a resource-constrained environment (Bedő, Erdős & Pittaway 2020). HEEE factors for developing students' E&I capabilities in a resource-constrained environment are identified in Chapter 7 and these contextual factors are explained through the current gaps of HEEEs and suggested mechanisms below. Understanding how the identified six contextual factors can be implemented in the learning environment is important for co-creating HEEEs and developing students' E&I capabilities. Thus, this section provides clarity on how an HEEE can be co-created in a resource-constrained environment by proposing specific actions through consensus from internal and external stakeholder groups.

8.3 Entrepreneurial leadership, entrepreneurial culture and entrepreneurship chair(s)

A combination of internal and external stakeholders who participated in this research emphasised entrepreneurial leadership, entrepreneurial culture and entrepreneurship chairs as mechanisms to adopt an entrepreneurial orientation within an HEEE; these are discussed below. Entrepreneurial orientation is known for strategic alignment of organisations with their roots as a firm-level unidimensional strategy (Lumpkin & Dess 2015). When adopting an entrepreneurial orientation, internal stakeholders including academics, administration, staff and students are likely to synergise towards a common vision and play a key role in supporting the higher education institution's entrepreneurial agenda (Klofsten et al. 2019). This entrepreneurial orientation spreads across departments and within the higher education institution, building an atmosphere and culture characterised by proactiveness, innovativeness and risk-taking (Todorovic et al. 2011). Leadership, culture and change agents in sync can facilitate the development of students' E&I capabilities within an HEEE in a resource-constrained environment.

8.3.1 Entrepreneurial leadership promoting students' E&I capabilities

The role of higher education institutions facilitating entrepreneurial-driven economic growth bears the responsibility of more than generating student start-ups and providing leadership for creating entrepreneurial capital (Audretsch 2014). Senior leadership and their long-term

commitment are considered a core factor for HEEEs (Allahar & Sookram 2019; Bischoff, Volkmann & Audretsch 2017). Building a successful HEEE requires the commitment and engagement of senior leadership, typically at the dean level and through to entrepreneurial senior leaders (Rice, Fetters & Greene 2014). Scholars Yu et al. (2017) applied to senior leadership as suggested by Rice, Fetters and Greene (2014) in a study of higher education institutions in Singapore and Taiwan. Through this research, it was found that institutions in Singapore had senior leadership committed to entrepreneurship through HEEEs while institutions in Taiwan did not appear to have such a commitment (Yu et al. 2017).

When questioned on key stakeholders of an HEEE, a dean of a higher education institution, interviewee DH2, said that:

“So, we have the heads and the deans who are leading this entrepreneurial initiative, who are responsible to a large extent, and they must do it within their capacity. Then we have the academics and the educators ... Without the support of the deans, such initiatives would fail within a private education institution. So, you definitely need commitment from the deans to sustain those initiatives. Because even if you have alumni, entrepreneurs, and other experts who in my opinion can contribute towards developing these entrepreneurs, no higher education institution can contribute to the same if you don't have the support and commitment from the top. If senior management does not strongly believe in the need for creating and developing student entrepreneurs, they will continue to push students for cooperate jobs.”

Both internal and external stakeholders that participated in this research agree that senior leaders of higher education institutions in Sri Lanka should actively drive entrepreneurship in a top-down approach.

An empirical study conducted across the US, UK, Ireland and Australia found that senior leadership plays a key ‘park ranger’ role in setting the higher education institution towards entrepreneurship (Thomsen, Muurlink & Best 2018). This means that the senior management sets the cultural tone, authorises initiatives and allocates resources (Thomsen, Muurlink & Best 2018). The commitment and engagement by senior leaders can be expressed in certain ways. For example, in the declaration of strategic intent such as the vision expressed with importance to entrepreneurship, such as the strategic vision of the National University of Singapore as “Toward a Global Knowledge Enterprise” (Yu et al. 2017). Further, it can be expressed in the allocation of resources, infrastructure and stakeholders by senior leadership,

which can vary from low to deep (Brush 2014). In a resource-constrained environment, senior leaders must understand the business benefits and impacts for individuals and society related to developing students' E&I capabilities within HEEEs. This understanding will extend to communicating initiatives to employees with a purpose and building a strong entrepreneurial orientation.

8.3.2 Entrepreneurial culture empowering entrepreneurship within the higher education institution

The creation of an HEEE is a key element of entrepreneurial higher education institutions and this happens through the entrepreneurial culture (Secundo et al. 2020). Higher education institutions with successful HEEEs consider fostering an entrepreneurial culture as vital (Allahar & Sookram 2019). A higher education institution's entrepreneurial culture plays a crucial role in not only harnessing the willingness of potential entrepreneurs of creating a start-up but also the willingness of other stakeholders like staff, investors and mentors working with potential entrepreneurs (Spigel 2016). Thus, scholars suggest that entrepreneurial culture influences how the HEEE and their actors navigate and engage, which impacts efforts (Bock et al. 2020; Huyghe & Knockaert 2015).

When promoting an entrepreneurial culture, it is necessary to recognise that it is senior leaders that set the tone of entrepreneurial culture at a higher education institution (Thomsen, Muurlink & Best 2018). Interviewee AI5, an angel investor, shared:

“At university level, the culture must support it. If one joins a higher education institution today if that entrepreneurial culture does not exist, then there is no way for that student to really learn about entrepreneurship, be interested in such a career or develop the necessary capabilities. So, the culture of these institutions has to drive their ecosystems. If you look at some of the popular universities that have successfully produced entrepreneurs and successful entrepreneurs are the ones that have that entrepreneurial culture nested within.”

As the culture and values of a higher education institution often orients their students, this in turn impacts their ability to recognise entrepreneurship. Thus, senior management needs to take leadership and commit to an entrepreneurial culture. In the effort to transform into an entrepreneurial culture, there can be student-led initiatives but more significant are institutional-led initiatives (Wright, Siegel & Mustar 2017).

A recent study by Bischoff (2021) highlighted the importance of local/regional entrepreneurial culture in creating sustainable entrepreneurial ecosystems. A mentor in entrepreneurship, interviewee SP4, said that:

“As an active member of the local entrepreneurial ecosystems I can say that there is a lot going on and people are doing a lot of things for young entrepreneurs and start-ups. Recently, I went to a pitching competition as a judge and there was one student who was given an offer on the spot. So, I think there is an increasing entrepreneurial culture and support at a national level. But now higher education institutions need to build up the same entrepreneurial culture within their space.”

This excerpt reinforces that advocating a strong entrepreneurial culture within the HEEE is important. The promotion of an entrepreneurial culture through strategic actions enables higher education institutions to adapt to their environment (Guerrero et al. 2014). Entrepreneurial leaders must build a shared entrepreneurial culture by doing things that highlight the importance of E&I, and the relevance of developing capabilities among students.

8.3.3 Entrepreneurial chairs as change agents

Higher education institutions are key enablers of economic growth and social development and they act as agents of change in society (Klofsten et al. 2019). Studies have explored how higher education institutions with an entrepreneurial mission in developing countries act as change agents in sustainable development (Wakkee et al. 2019). To be effective, this extends to staff of higher education institutions, requiring them to act as change agents. Change agents can be members of senior management, academic staff or staff within the institution. For instance, staff responsible for entrepreneurial activity within a higher education institution can be identified as entrepreneurship ‘chairs’ and they are positioned to drive actions promoting entrepreneurship (Rice, Feters & Greene 2014). Entrepreneurship chairs were suggested in an early study by Rice, Feters and Greene (2014) but do not seem to resurface in the other identified HEEE studies. Such staff delegated with the responsibility to drive entrepreneurship within the higher education institution were identified in this research, among two out of the six participating institutions. Interviewee DH2, a head of school, commented:

“We have two entrepreneurship pillars appointed for the role of fostering the entrepreneurial spirit among students. Basically, to promote entrepreneurship our students. The e-club is one of their responsibilities as well. Monthly they have to report what has been achieved and discuss upcoming initiatives with the management.”

Further, interviewee DH4, a head of academic affairs, shared:

“So, we have what is called an entrepreneurship circle and a staff member is put in charge of this initiative. Students from the different programs are part of it. Initially it was a handful of students but now we have a large group of students actively working in this circle. The chair is responsible for various outcomes at the end of the financial year. Students launch start-ups through this circle but of course these are small side hustles like a cupcake business promoted through Facebook.”

Having such internal role models will gradually build an entrepreneurial culture of rewarding E&I (Gibb, Haskins & Robertson 2013). These employees are an essential part of the institutional infrastructure for managing and advancing HEEE efforts (Rice, Feters & Greene 2014).

In resource-constrained environments, senior management must identify potential change agents, share the purpose and assign responsibility for promoting E&I. This new role can complement the current duties and responsibilities of existing staff beyond heads of departments and academics. Such change agents can champion building internal teams and collaborating with stakeholders from the wider entrepreneurial ecosystem as well.

8.4 Entrepreneurship curriculum, practical pedagogy and real-world assessments

Multiple stakeholders discussed how entrepreneurship curriculum, pedagogy and assessments should be addressed in delivering E&I education within the HEEE. Entrepreneurship education is a key contributing factor that supports entrepreneurial activities within the entrepreneurship education ecosystem, strengthening the business environment of a country (Regele & Neck 2012). Higher education offers an incentive to attract potential entrepreneurs through study programs that are most relevant for markets and best ensure success of new start-ups in the future (Bauman & Lucy 2021). According to the literature, entrepreneurship and entrepreneurship education are on the rise in the US (Bauman & Lucy 2021; Regele & Neck 2012); however, this may differ in a resource-constrained environment such as Sri Lanka. With changes in the environment, so have expectations of education changed.

8.4.1 Entrepreneurship and innovation education for all students

Curriculum, including program and content, is a key building block nested in the ecosystem when universities facilitate entrepreneurship (Brush 2014; Kuratko 2005). Scholars seem to view entrepreneurship education through a narrow lens resulting in a fragmented snapshot of

entrepreneurship curriculum (Shane 2003). Whether it is instilling entrepreneurship through means of a core module, elective unit or a major, a great deal must be focused on developing the entrepreneurship curriculum (Fetters, Greene & Rice 2010). According to interviewee PS6, a mentor in entrepreneurship:

“You can’t become an entrepreneur just because you learn about entrepreneurship. So, it is better to have entrepreneurship as options for any study program where they can get the entrepreneurial knowledge and skills no matter what they are studying. Entrepreneurship and innovation should go hand in glove with Computing, Fashion, Law or basically any area for that matter. Like entrepreneurship within dentistry or entrepreneurship within agriculture. So that they can consider a business or become an entrepreneur in their area or expertise.”

The shared view among external stakeholders is that entrepreneurship should be offered in the form of core, elective and zero credit units to all undergraduates, including business and non-business students.

In 1970, only 16 higher education institutions in the US offered entrepreneurship education and today more than 2,300 US colleges and universities offer courses in entrepreneurship (Bauman & Lucy 2021). Unlike in the US, where there is an increase of entrepreneurship majors offered, none of the six participating higher education institutions offer an undergraduate degree in entrepreneurship. A head of a business school, interviewee DH6, said:

“We don’t offer a degree in entrepreneurship, but our students can opt to progress into an entrepreneurship bachelors with a partner university overseas if they are going international to complete the degree.”

The common decision not to offer an undergraduate degree in entrepreneurship is due to the low number of students wanting to enrol in an entrepreneurship degree for undergraduate studies. Further, it is also the perception of external stakeholders that, more than an undergraduate degree in just entrepreneurship, entrepreneurship should be embedded into the curriculum of various study fields.

8.4.2 Practical-oriented pedagogy for delivering entrepreneurship and innovation education

Since the mid-1990s, teaching entrepreneurship has become a challenge for universities (Carlsson et al. 2013), and contributions from scholars of diverse fields of study have been published. Studies report that potential entrepreneurs learn by copying, from experiment, by problem-solving, from opportunity taking, and from making mistakes where learning involves theorising, acting, experiencing and reflecting (Taylor & Thorpe 2004). However, there is no consensus or a universal pedagogy on teaching entrepreneurship (Fayolle & Gailly 2008). Teaching entrepreneurship has challenged old pedagogies by recognising new ways of teaching and learning (Hoppe 2016). When planning the pedagogical side of a unit or course, it is always good to add an element of surprise for students as predictability means students become bored in the classroom (Fiet et al. 2000). A future research direction suggests the need for research on pedagogy focused on developing capabilities of potential entrepreneurs (Neck & Greene 2011).

Entrepreneurial learning seems to be growing in an alternative way where entrepreneurship modules are delivered through mixed theory–practice learning (Belitski & Heron 2017; Hoppe 2016). Interviewee PS1, an external mentor and coach in entrepreneurship, said:

“The more academic it is, the less I believe in it, the more professional or more practical it is, it is definitely valuable to student entrepreneurs. You know, when teaching I believe it should be more integrated with theoretical knowledge, practical skills and self-reflection. These are important for the future entrepreneurs which is not the same as businessmen we had from decades ago.”

A head of a business school, interviewee DH6, added:

“So, these students receive the knowledge within the degree but, you know, it is really the attitude towards entrepreneurship. We always encourage the student to take up initiative and give them confidence. We are not limiting ourselves to the traditional pedagogical, you know. It is combination of teaching approaches but mostly collaborative teaching to engage students with others. When teaching, students learn from each other as well.”

Scholars such as Lourenco et al. (2013) advocate 30/70 pedagogy design where a session should consist 30% of the time to instruct/review theory, concepts and tools and impart theoretical knowledge, and 70% of the time for practical learning through a video, case/story or guest speaker and then practical application through individual or group activities.

8.4.3 Real-world assessments

When suggesting entrepreneurship education frameworks at the university level, scholars have identified one of the key facets as assessments (O'Brien et al. 2019; Maritz & Foley 2018; Maritz & Brown 2013; Fayolle & Gailley 2008). Assessments in the forms of testing concrete behaviour of individual students or groups are best supported, rather than being merely written examinations and reports, in the entrepreneurship discipline (Hoppe 2016; Gibb 2002). Learning through experimental work involves trial and error and encourages entrepreneurial projects (Hoppe 2016; Gibb 2002). Hence, entrepreneurial learning should be designed to have suitable assessments for effective evaluation and measurement of learning outcomes (O'Brien et al. 2019).

Learning is shifting from the traditional lecture-based to increasing practice-based sessions for more experience of entrepreneurship, where students pursue learning activities or projects in classrooms or incubation centres on campus, or outside on projects with start-up entrepreneurs (Neck & Greene 2011; Gibb 2002). Therefore, entrepreneurship, like any creative activity, is best learned through hands-on practice (Johannisson & Madsen 1997). It is argued the entrepreneurial capabilities are developed when people learn from experience where they are involved in and mostly practice, for example, problem-solving skills (Pittaway & Cope 2007). This is in line with interviewee A11, an angel investor, who stated:

“If you look at the nature of entrepreneurship, it involves finding an innovative solution to a particular problem. This practical thought process can be developed or supported through assessments to arrive at practical outcomes. Assessments should be designed to push students to arrive at more than a written report and be involved in doing activities or projects. These activities support to get the so-called entrepreneur attitude into their mind and body. From such assessments, they learn from their mistakes too.”

Educators may want to engage students in real-world assessment, taking a hands-on approach to learning.

The gaming industry has evolved, and games entertain the player and inspire action, effect attitudinal change or instil lessons (Keitt 2009). Digital tools such as online games expose students to real business situations and challenges in a virtual world, aligning them to learn while they play (Volkman et al. 2009; Pink 2006). Universities such as Babson have experimented with and embedded various educational games into the entrepreneurship curriculum and toolbox, allowing students to practice entrepreneurship (Regele & Neck 2012; Harmeling & Sarasvathy 2011). A study that investigated over 2,000 students using more than 100 stimulation games in Germany revealed that stimulation games have high learning effects and suggest their use in entrepreneurship education (Huebscher & Lendner 2010). While engaging in games facilitates experiential learning, it also allows assessing how students act and adopt entrepreneurial behaviours based on their entrepreneurial knowledge and experiences (Kriz & Auchter 2016; O'Connor 2013).

Entrepreneurs who founded tech start-ups, such as interviewee AE1, said:

“Entrepreneurs are known to have a unique mindset and way of thinking. Some of the guys in one of my start-ups are gamers and the way they think is amazing. They are quick, adaptive and team oriented. So, having things like online games to evaluate students is a new trend, right? It is more practical than a written exam or report. People have scored As and got first class degrees, but they don't necessarily become successful entrepreneurs. It's about thinking ability and skills.”

One such video game supported students to think like entrepreneurs under conditions of uncertainty and risk (Neck et al. 2011). This means online stimulation games need to be carefully selected based on the learning outcomes that need to be accomplished (Fox et al. 2018). However, there is an argument that while simulation games can be useful, there could be real-life tests that could evaluate entrepreneurship education (Ratten & Usmanij 2020).

8.5 Research-based coursework, research conferences and research-based projects

Stakeholders are of the view that research-based coursework, research conferences and research-based projects are initiatives that higher education institutions can offer to develop research skills within an HEEE. Higher education institutions striving to fulfil the three core activities of teaching, research and entrepreneurship and adopt a coordinated strategic alignment across these critical activities attempt to provide a conducive environment for their students, staff and university community (Guerrero et al. 2014; Kirby et al. 2011). To this end, research is a salient factor that combines with teaching and entrepreneurship in harmony for

the emergent phenomenon with a positive impact on economic and social development (Etzkowitz 2014). An HEEE study based on a traditional research higher education institution is identified as the one study that suggested research as a key HEEE factor when compared with the extant literature (Miller & Acs 2017).

8.5.1 Research-based coursework

There is academic debate on whether there is a positive impact of research on developing students for entrepreneurship (Mason & Brown 2014; Brush 2014; Walter et al. 2013; Neck et al. 2011). External stakeholders of this study advocate research for student E&I capabilities in congruence with Mason and Brown (2014), Brush (2014), Ucbasaran et al. (2008) and Arenius and De Clercq (2005). Interviewee SP5, an external mentor in entrepreneurship, said:

“Research skills is so important. You should have information about your own product, competing products, quality and everything. That’s a basic knowledge from research. Next you should have knowledge about the market and industry. Then the broader environment including new laws, economic situation, technology developments. Research is crucial in entrepreneurship and students should be taught how to research, especially problem-based research and use information and data in businesses. This will sharpen their problem solving and critical thinking. This is something that can be embedded in students through assessments they attempt during the study program.”

External stakeholders suggest developing research skills and knowledge among students for E&I using research-based coursework within HEEEs.

Scholars such as Rothaermel et al. (2007) argue that higher education institutions should engage more in applied research when becoming more entrepreneurial. Similarly, external stakeholders suggest prioritising applied research for developing students for E&I, allowing them to generate practical solutions. Applied research uses accumulated theories, knowledge and methods for a specific purpose or problem (Brush 2014). Interviewee AC5, an academic teaching an entrepreneurship-related unit, stated:

“... students get exposed to research through their assessments. Units such as Marketing and Finance have assessments that require students to research, primary and secondary. Marketing assignments tend to be case study based where students end up suggesting solutions for a problem that a product or brand faces. Even for their capstone project they do research. For example, students select a problem or

opportunity they are interested in, conduct research on it and write their project. We give our students the freedom to select a more academic orientated through a dissertation or a business plan. Students who are keen on entrepreneurship go for the business plan option. The purpose is to allow them to apply research in different contexts, get in-depth knowledge of the area and come up with a practical solution.”

Therefore, students should be given the task to apply research in assignments across the different fields of study and not be limited to entrepreneurship-related units within an undergraduate degree.

8.5.2 Research conferences exposing students to scientific knowledge

The trajectory of entrepreneurship education resulted in the first major academic research conference on technical entrepreneurship in 1970, followed by the first entrepreneurship research conference and publication in 1981 by Babson College (Katz 2003). The Babson College Entrepreneurship Research Conference was a major effort by the university, dedicated to increasing the understanding of entrepreneurship by encouraging early-stage research on entrepreneurship and creating a useful networking opportunity for global entrepreneurship scholars and researchers (Fetters, Greene & Rice 2010). Given the benefits of researching entrepreneurship, entrepreneurship research conferences and centres were identified as a factor of HEEEs (Rice, Fetters & Greene 2014).

To understand how research conferences develop students, views from various stakeholders were considered. Research conferences are possible platforms to help students link theory and practice and develop related skills, and excerpts from interviews resonate with the relevance of research conferences for students. Interviewee DH5, a chief academic officer, said:

“We host a research symposium, and this is the third consecutive year it is running. All schools of the institute contributes, and entrepreneurship is one area covered. Of course, for this is for traditional academic interest but we cannot discount the value it offers for students. For a potential entrepreneur it is more about new knowledge and linking the theory to practical situations. It is a chance for students to get involved in researching problems that companies and industries face and arrive at real world solutions through their papers.”

Further, interviewee AC5, an academic teaching entrepreneurship, commented:

“We don’t have a research committee, centre, or conference in-house within the institute. But our students and staff attend research conferences outside. There are external conferences, and we receive invitations for these. So, we make sure that our students participate and contribute. Although these are more academic conferences, students can contribute to knowledge or get exposed to problem solving, presentation skills and research skills for entrepreneurship.”

In this study, the value of research conferences is recognised by internal stakeholders with the view that students are knowledge producers. However, research conferences are not opposed by external stakeholders. The benefit is perceived to be more indirect but not irrelevant to developing student E&I capabilities.

8.5.3 Research for start-ups

There can be various research projects encouraged within the HEEE, including research projects to develop prototypes (Rasmussen & Borch 2010). In this study, the emphasis is on research-based projects with entrepreneurs and their start-ups. Interviewee EE4, an award-winning social entrepreneur, said:

“I worked with some students from a design institute on a project and it was a research project for them. Instead of coming up with solution in-house I reached out this institute. The task was for students to propose a packaging solution for a new organic start-up I was working on and I was quite happy with their suggestions that we selected one of it and implemented it. Students had done good research, found the right materials, how to source these materials locally, and suggested sustainable ideas for the packaging solution. This is the best way for them to get hands-on research experience by working with projects.”

Through such research-based projects, students become exposed to applied research by conducting market research and arriving at innovative solutions for specific problems or opportunities. Moreover, students become open to the broader environment including markets, industries and ecosystems outside the institution.

Previous research suggests that an entrepreneur’s research skills influence their decisions (Di Greorio & Shane 2003). Interviewee EE5, an entrepreneur of a fashion start-up which become an international brand, stated:

“When you’re looking at entrepreneurship, and how research can support that, research becomes so important for budding entrepreneurs. When students work on research projects for start-ups or for a company, it really takes their inner strengths out and puts them on a trial. So especially when you are starting off, they need to know how to make the most of research and use that information wisely in starting and scaling.”

Student involvement in various research-related projects can inspire and develop them to create a self-made career path as a potential entrepreneur. For this initiative, higher education institutions can connect with entrepreneurs and offer them access to students as a provision of talent that can be deployed for research. Such research project work, like researching business start-up opportunities or designing suitable packing for a new product, can not only provide ‘hands-on’ activities, but can also engage external stakeholders, such as start-up entrepreneurs, thus extending the students’ perspectives (QAA 2018).

8.6 Entrepreneurship competitions, internship with start-ups and start-up projects

Entrepreneurship-related competitions, internships with start-ups and start-up projects emerged as specific actions to operationalise enterprise experiences for students within the HEEE, through interviews with internal and external stakeholders. Diverse stakeholders suggested these mechanisms as specific actions to offer enterprise experiences for students within the HEEE. However, enterprise experiences are not limited to competitions, programs, projects, forums and events (Brush 2014). Students can learn entrepreneurship through a combination of curricular, co-curricular and extracurricular activities (Bischoff et al. 2017). These activities complement and extend students’ academic knowledge through a wide range of activities while supporting student and graduate entrepreneurship (Al-Dajani et al. 2014; Rae et al. 2012). Extant HEEE studies such as by Webber, Kitagawa and Plumridge (2020) found that enterprise experiences such as internships have more influence on shaping students’ entrepreneurial intentions compared to formal education in a classroom.

8.6.1 Entrepreneurship competitions at institution, inter-institutional or national level

Giving students significant opportunity to practise and experience is critical to encouraging interest in entrepreneurship (Barr et al. 2009) and creating enthusiasm among peers within the HEEE (Fetters, Greene & Rice 2010). Interviewee DH1, a dean of academic affairs, stated:

“Couple of our students won at the social innovation competition which is an external event organised at a national level with participation drawn from institutes across the island. After becoming winners at the competition, their idea was funded and led to a social start-up. I feel that this achievement gave these students the confidence to consider a career as an entrepreneur and the winners spread some excitement for new students to get inspiration from.”

Multiple stakeholders including deans, academics and entrepreneurs articulated that students gain confidence to consider entrepreneurship as a career and develop capabilities they need for entrepreneurship by participating in related competitions. Interviewee AC5, an academic teaching an entrepreneurship-related unit, added:

“... there are very less competitions when it comes to entrepreneurship. But students participate in various competitions like business idea organised by external association or at national level. Irrespective of the nature of the competition, I think it motivates students to step forward, perform and excel. Most competitions have attractive rewards too. But mostly they are all opportunities to get experience, showcase their skills and build their aptitude.”

With the limited availability of business idea competitions internally, some external stakeholders are of the view that higher education institutions should direct students towards inter-institutional or national competitions.

There is debate about the effectiveness of business plan competitions (Honig & Karlsson 2010). Scholars of six HEEE studies suggested business plan competitions for students interested in entrepreneurship (Shil et al. 2020; Secundo et al. 2020; Meyer et al. 2020; Miller & Acs 2017; Wright, Siegel & Mustar 2017; Rice, Fetters & Greene 2014). Interviewee DH5, a chief academic officer, shared:

“Innovation and entrepreneurship of our students is displayed at the annual competition. Where they display their novel ideas and prototypes to corporates and industry. Through this event, students have received the opportunity to join and work with companies who were interested in their innovation. This experience has empowered students through trial and error before actually venturing into their own start-up.”

Further, the benefits of such competitions vary, from an actionable business plan, to coaching and training, cash rewards, seed funding, consultancy services, networking opportunities and commercialisation (Grimaldi et al. 2011).

8.6.2 Internship opportunities with start-ups in a range of different industries

An internship is considered a methodology for teaching entrepreneurship (Hasse & Lautenschläger 2011) and internship with a start-up is deemed essential for experiential entrepreneurship education (Fayolle et al. 2006). Scholars argue that a greater emphasis is needed on experiential learning, such as through internships with start-ups and other hands-on activities that involve students interacting with entrepreneurs (Volkman et al. 2009). For instance, in response to the Asian financial crisis of the late 1990s, the National University of Singapore expanded its remit by introducing several entrepreneurial initiatives including internships in start-ups for its students (Etzkowitz 2014).

Sri Lanka does not have a long history of internships within a study program in the private higher education sector and degrees have been predominantly focused on learning through the set curriculum. Interviewee SP2, a mentor in entrepreneurship, commented:

“Nowadays more universities tend to offer more internship to students but these are internships to work for multinational companies like Unilever, Nestle. But in my view, is that internships can be with start-ups or even SMEs. Students can work for start-ups, developing ventures and understand the grassroots level of a business. These experiences become helpful when students have to set up their own company, craft the organisational model, validate their proposition and develop the go to market strategy. That would be the best way of learning.”

This benefit of start-up experience leading to start-up success is in line with an HEEE study by Meyer et al. (2020) that looked at interest in students taking up work in start-ups or growing venture companies.

A few scholars suggest that HEEEs should include work experiences or internships (Shil et al. 2020; Meyer et al. 2020; Miller & Acs 2017). A study on entrepreneurial capabilities in Vietnam found that students should be mainly trained in entrepreneurship through practical experience during internships when compared with thematic courses, curricular subjects, extracurricular activities and projects commissioned by enterprises (Devetag et al. 2020). However, the general practice among higher education institutions in Sri Lanka is promoting

standard internships with multinational companies. Interviewee DH1, a dean of academic affairs, said:

“... one small example is when Mr Merrill Fernando came for a seminar to talk about Dilmah and his entrepreneurial story of founding a global tea brand. We ended the seminar with new product ideas for Dilmah and a group of students proposed tea flavoured cereal. He thought that’s very innovative, and he liked the idea so much that those students were invited for a factory visit. Some of them ended up doing an internship with him. These are the different life experiences which help them drive their entrepreneurial spirit and ambitions forward.”

Thus, external stakeholders consisting of entrepreneurs and mentors are of the view that higher education institutions should offer students internship opportunities with start-ups in a range of different industries.

8.6.3 Start-up projects through the institution or external organisations

A start-up project is a funded project designed to enable students to start a new venture. A study by Jones et al. (2015) evaluated ‘Beta’, a start-up project for undergraduate students that grants GBP1,500 of seed funding to students for initiating the start-up process. The purpose of the ‘Beta’ start-up project was for participating students to complete the project with an economically viable business that offers promising self-employment post-graduation (Jones et al. 2015). With the growing importance of start-up projects, scholars suggest higher education institutions should provide a start-up project with initial funding, to integrate a second level of funding (Jones et al. 2015) and even to replace student placements with a start-up project (Matt & Schaeffer 2018).

During the interviews an external mentor in entrepreneurship, interviewee PS6, said:

“Even evaluating business proposals, hiring for myself, or even when I’m hiring for my portfolio companies, I do look whether students have engaged in any projects, and especially related to start-ups. Because then they are likely to have a better understanding of how do you perform in a team, understanding their role in that team and even leading the team, so that the overall objective becomes accessible, that’s exposure.”

Such views establish the need for higher education institutions to encourage students to try start-up projects that contribute to getting experience and advancing skills.

Start-up projects have been found to affect students' start-ups and entrepreneurial mindset in HEEE studies (Longva 2021; Secundo et al. 2020; Wright, Siegel & Mustar 2017). Interviewee SP1, an external mentor and coach in entrepreneurship, illustrated:

“I strongly believe participating in various projects is very important. I encourage my son to take part in any opportunity of start-up-related projects through university because I have learnt that through projects one cultivates various elements such as leadership, teamwork, confidence, resilience, problem solving and more. I know that I did. I know others have. Most importantly, it is that attitude that grows in you to seize opportunities to develop yourself. This is one thing that makes students ready for entrepreneurship and even the modern society.”

In France, the government took the initiative to provide cash prizes between EUR5,000 and EUR20,000 to 53 out of 600 students with a promising start-up project (Wright, Siegel & Mustar 2017). While government support in such start-up projects for students of private higher education institutions is almost non-existent, external stakeholders believe that higher education institutions should offer it through internal schemes or collaborate with external organisations for this purpose.

8.7 Peer engagement, the alumni entrepreneur network and access to external stakeholders

An entrepreneur is increasingly recognised as a social animal, working socially, and engaging with and in the social milieu (Jack et al. 2008). Entrepreneurial networks create a social environment for students to connect and engage with people who may support their entrepreneurial careers (Mueller 2011). Within higher education, networking can provide access to information, support, resources and even help one to acquire capabilities from others (Tomy & Pardede 2020). Resource-constrained environments are likely to lack dense entrepreneurial networks (Bedő, Erdős & Pittaway 2020), thus it is important to bridge the connections and connectivity within the HEEE and between the HEEE and external stakeholders. The concept of an HEEE proposes interconnectedness with all stakeholders to perform in the entrepreneurial environment (Shil et al. 2020). Multiple stakeholders highlighted peer engagement among students, an alumni network of entrepreneurs and access to external stakeholders as ways for students to develop connections through their HEEEs.

8.7.1 Peer engagement at institution and inter-institutional levels

Networking among peers across departments and schools was found to be a key initiative influencing the increase in creating start-ups at Massachusetts Institute of Technology (Roberts & Eesley 2011). Students networking with each other build a network channel for continuous engagement, breaking the traditional practice of campuses being active only during term (Belitski & Heron 2016). This peer engagement can take various forms within higher education and an entrepreneurs' club is one of them (Allen & Liberman 2010). Research suggests that social norms and the interactions of a network may have significant impact on a student towards entrepreneurship (Krueger et al. 2000). The collective view of stakeholders, as expressed below, is that an entrepreneurs' club is a supportive community for aspiring entrepreneurs.

Interviewee EE4, an award-winning social entrepreneur, said:

“When I was studying, we didn't have opportunities like to engage with other students much. I think that something like a club or community will draw people who are interested in entrepreneurship and even promote entrepreneurship. These communities will allow people to share their ideas and feelings with similar students. And then I think, it will encourage people towards entrepreneurship and even come up with good ideas, maybe. So, I think is good for students to mix with other students from other programs and even other institutes. This interaction and exchange between students help the process and even have better understanding of it.”

Interviewee DH6, a head of a business school, shared:

“For networking, we have a few clubs established which are all student led clubs, actually. One is student activity club. Then the Toastmasters club, and we have an entrepreneurs' club. If you look at these clubs, all of them provide exposure indirectly and directly for entrepreneurship. They can expand their interests and thinking. It starts from the thinking pattern when you meet the like-minded entrepreneurial people. As part of the club, they engage with the community for different purposes or even address different problems. Through these clubs, they network but they also develop their strengths and skills during their involvement and effect their behaviour.”

Such networking can result in acquiring competencies and knowledge from others that contribute to students' entrepreneurial self-efficacy (Tomy & Pardede 2020).

An entrepreneur club, also known as an eClub, is designed for undergraduate students who are keen on entrepreneurship and are considering a self-made career by starting or buying a start-up or business (Allen & Liberman 2010). Members of the entrepreneur club join forces to help each other achieve their individual goals and produce networking events with alumni entrepreneurs, other successful entrepreneurs, investors, topic experts and other stakeholders (Allen & Liberman 2010). Although the benefits are clear, not everyone is willing to share knowledge, and this raises the question of which mechanisms can engage network collaboration (Ratten & Usmanji 2020).

Higher education institutions in the US put great emphasis on experimental learning through internal communities such as student clubs and communities (Finkle et al. 2013). Moreover, student communities such as the National University of Singapore (NUS) are considered powerful via word-of-mouth marketing, spreading the entrepreneurial spirit (Ho et al. 2018). Another study has acknowledged the role of student clubs such as NUS Entrepreneurship Society, National Taiwan University Entrepreneur Association, and University of Southern California eClub (Yu et al. 2017; Allen & Liberman 2010). This network influence is validated where student clubs are included as a building block of the HEEE model, suggested in work by Rice, Fetters and Greene (2014). However, there is the argument that student clubs draw low commitment compared to an incubator facility encompassing faculty, alumni and entrepreneurs that is accessible by a large pool of students attracting higher commitment towards entrepreneurship (Brush 2014).

8.7.2 Alumni entrepreneur network

Networks can be used to exchange knowledge and experiences for entrepreneurial learning and build entrepreneurial skills (Belitski & Heron 2017). Alumni of the University of Southern California represent a significant importance to its HEEE, where they give back to the entrepreneurial student body through start-up funding, jobs, internships and time (Allen & Liberman 2010). Scholars argue that alumni entrepreneurs and their start-ups are an available asset for any higher education institution that play a major role in developing potential entrepreneurs, identifying opportunities and forming new start-ups (Miller et al. 2017; Siegel & Wright 2015). Further, it is an important issue for higher education institutions to engage their students with alumni start-ups and SMEs bridging connections to the local entrepreneurial ecosystem (Webber, Kitagawa & Plumridge 2020).

A study by Longva (2021) suggests that students develop their social capital within their HEEE. Interviewee DH5, a chief academic officer, shared:

“We have a large pool of alumni entrepreneurs and we bring them together through something called IGNITE. It is an alumni network that operates as a forum and collaborate for various initiatives. It’s an alumnus led body consisting of alumni entrepreneurs that involve current students in events and skill development programs. Their interactive monthly discussions are a safe place for students to engage, ask questions and learn entrepreneurship outside of the classroom through workshops and other activities.”

This alumni networking is similar to the University of Southern California, which hosts an alumni network day every month that is well-attended by 300 to 400 individuals with an interest in entrepreneurship leading to start-ups (Allen & Lieberman 2010). Other examples are the Babson alumni network, which was the first step to creating a network focused on entrepreneurship within its HEEE (Fetters, Greene & Rice 2010) and the Massachusetts Institute of Technology’s high-level alumni network (Ribeiro et al. 2018).

Resources are a key driving force of the entrepreneurial process and alumni entrepreneurs play an indirect role in a network providing resources to current students (Bauman & Lucy 2021; Rasmussen & Wright 2005). For current students to receive this benefit, initiatives must be put in place within an HEEE. Alumni entrepreneurs themselves may lobby the higher education institution to establish such entrepreneurship initiatives and be willing to provide funding and advice to get initiatives within the HEEE organised and running (Meyer et al. 2020; Rice, Fetters & Greene 2014). Interviewee AC5, an academic teaching an entrepreneurship-related unit, said:

“Since we are somewhat of a new institute, our alumnus is not large in numbers. But among graduated students, some of them have their own start-ups and businesses. They have start-ups in various area such as fashion, baking and even music and they want to interact with the current students. Our alumni entrepreneurs gets involved with institute as well as the current students. If we have an annual event they would bring in sponsorships. If a student wants any information, we connect them to our alumni. This way current students have some access to an alumni network of entrepreneurs to reach out. But all this is currently rather informal.”

In addition to organically growing an alumni entrepreneur network, another approach is through an incubator of the higher education institution, which attracts a loyal group of alumni (Theodoraki et al. 2018).

8.7.3 Access to external stakeholders

Involvement of external stakeholders on programs is vital for the co-creation of an HEEE (Wright, Siegel & Mustar 2017). Even within the HEEE, entrepreneurship succeeds when external stakeholders are embedded in the entrepreneurship education ecosystem, catering to aspiring entrepreneurs (Isenberg 2010). Research has found that direct involvement of external stakeholders from the entrepreneurial ecosystem can guide students on their entrepreneurial process by identifying opportunities and transferring knowledge (Secundo et al. 2020). Scholars such as Allahar and Sookram (2019) suggest that higher education institutions that face a relatively slow development of their HEEEs can accelerate growth to a more fully-fledged HEEE through stronger collaboration with external stakeholders.

External to a higher education institution, other primary stakeholders in the entrepreneurial process are alumni entrepreneurs, start-up entrepreneurs, investors (angel investors, venture capitalists, crowd-source funding), mentors, professional service providers, corporations and government officials (Meyer et al. 2020). These external stakeholders may be involved in various activities of the HEEE, including entrepreneurship education or extracurricular and other activities (Bischoff et al. 2018). Interviewee SP2, a mentor in entrepreneurship, shared:

“Of course, the role and ownership are on the institutes per se and they need to have a setup for collaborating with external stakeholders for activities which can benefit its students. It could be to create inspiration through experience sharing, validating a business idea, or even finding seed capital. There are plenty of external stakeholders who are willing to contribute and help students. So external stakeholders need to be attracted and connected to students to support students with advice and resources. But this needs to be structured”.

Therefore, higher education institutions need to create the opportunities for external stakeholders to engage with students. External stakeholders can be involved and play a role in all six identified HEEE factors. The possibilities of this involvement will be further discussed in Chapter 9.

8.8 Mentoring, incubators and accelerators

One of the attributes of a successful start-up community is support services (Feld 2012). Entrepreneurship support is identified as a key function of HEEEs along with entrepreneurship education (Rice, Feters & Greene 2014). Types of entrepreneurial support can include a variety of broad, functional and specialised services (Hruskova & Mason 2020). Generally, entrepreneurial support is meant to provide training and resources to potential entrepreneurs and their start-ups (Spigel 2016). A study found that students perceive and desire educational support the most, followed by concept development support and finally business development support from higher education institutions in Australia and Europe (Kraaijenbrink et al. 2010). Higher education institutions can offer a continuum of entrepreneurial support activities depending on the needs of their students; these can range from early stage to development stage (Wright, Siegel & Mustar 2017). Mentoring, incubators and accelerators are the three mechanisms that emerged from the interviews with various stakeholders as suggestions for higher education institutions in Sri Lanka.

8.8.1 Mentoring with practitioners including start-up entrepreneurs

Leading higher education institutions have developed a sustainable network of entrepreneurship mentors to deploy as experienced advisors for specific students (Meyer et al. 2020). The National University of Singapore recognises mentoring as one of the mechanisms that strengthens its HEEE (Rice, Feters & Greene 2014). One HEEE study found that developing entrepreneurs within the higher education environment requires appropriate mentoring for potential entrepreneurs (Shil et al. 2020). In another instance, an incubator or an accelerator of a higher education institution can offer mentoring for its participants as a key service (Allahar & Sookram 2019; Wright, Siegel & Mustar 2017).

Active mentoring provides every student with support to solve business problems through an expert (Shil et al. 2020). In contrast, mentoring through experienced mentors among the investigated higher education institutions tend to take the form of seminars and workshops, which addresses students in general. Interviewee DH5, a chief academic officer, stated:

“Currently we offer students mentoring through seminars and workshops in small groups of students. You know, we discuss topics like how to become a successful entrepreneur? how to pitch a business idea?, how to design a lean start-up?. Of course, these are ad-hoc, but these sessions have been useful for students to gain practical training to setup a new start-up and any advice that improves their awareness. Some

students participate because they are keen to take a step forward and want information and others are more of collecting information type. Either way the mentoring sessions conducted by externals give students something more related to entrepreneurship.”

Compared to this practice, external stakeholders suggest mentoring to be organised on an ongoing, one-to-one basis using entrepreneurship-experienced mentors.

In developed countries like the US, Canada and Europe mentoring is considered a free service that is extended voluntarily (Meyer et al. 2020). This is similar to the Sri Lankan context where there are experienced mentors who are willing to step up and mentor potential entrepreneurs of higher education institutions. Interviewee PS4, a mentor in entrepreneurship, said:

“I am working on a mentorship initiative, but I find it very difficult. Maybe it is this Sri Lankan context here. Even going into the private higher education sector for free and offering our resources and time to help students, I still find a lot of barriers. Our future youth can benefit from a mentor who will elevate their potential and achieve their goal. In my process, we train and develop the mentee also how to receive the best. But higher education institutions need to give us access to do this service.”

This highlights that a higher education institution can develop their internal mentorship program and collaborate with external mentors to come onboard for the benefit of their students.

8.8.2 Fully-fledged incubator, internally or with external support

Business incubators were first established in the 1950s, and became popular, quickly spreading worldwide, primarily in developing countries (Voisey et al. 2013). Establishing an on-campus incubator for students and graduates not only facilitates new start-ups but also upgrades a higher education institution from an isolated to a networked institution, creating relationships with private and public sector stakeholders interested in entrepreneurship (Etzkowitz 2002). Other studies relate incubators within the higher education institution to create successful start-ups by students and graduates (O’Brien & Cooney 2019; Breznitz & Zhang 2019; Etzkowitz 2013), and still others argue that hosting an incubator guarantees an influence on the rate of start-up activity (Di Gregorio & Shane 2003).

Entrepreneurial universities have accepted the variety of benefits that a business incubator can offer to students/graduates, staff and institutions, acknowledging that it can

initiate and promote student entrepreneurship (Al-Dajani et al. 2014; Rasmussen & Borch 2010). Interviewee DH2, a head of school, shared:

“We have a dedicated Incubation Centre which was established a few years ago as an entrepreneurial arm. This was established with the purpose to empower students and support their innovative projects with commercial value. It is fully funded by the institute itself and not many institutes can do this on their own. Students are given the opportunity to work on their entrepreneurial projects through the fully equipped incubator at no cost. I think the most important aspects is the sharing of knowledge that happens within the incubator. These students also receive training opportunities related to entrepreneurship like workshops and seminars. Services of the incubator are accessible to all students regardless of their year of study.”

A university business incubator is an essential element of entrepreneurial support for HEEEs (Theodoraki et al. 2018). An academic teaching an entrepreneurship-related unit in a different institution, interviewee AC3, said:

“We offer an in-house incubator for our students and students from any field of study can use its services. Student can run their business in this incubator for two years without any overhead costs including rent, energy, wi-fi and so on. They can grow their business during this time and phase out into a place of their own. Engaging in the incubator can impact their attitude towards a self-made career. This incubator is monitored and supported by staff, and it is our way of supporting our students to successfully launch their ventures.”

Three of six institutions do not currently have an internal or access to an external incubator. In this case, higher education institutions are unable to fund and operate an internal incubator and should reach out for external support. Internal and external stakeholders collectively perceive that incubation centres develop students' E&I capabilities and help them with a new start-up through fully-fledged facilities.

8.8.3 Accelerator programs available privately or nationally

An accelerator is a functional entrepreneurial support activity (Spigel 2016). Having a standalone accelerator with committed resources and infrastructure signifies high commitment to entrepreneurship by a higher education institution (Brush 2014). Student interest in entrepreneurship is influenced by supportive infrastructure such as an accelerator (Huang-

Saad, Fay & Sheridan 2017). Students with start-up ideas look for opportunities to move into incubator and accelerator facilities. Interviews confirmed that there were no accelerators attached to any of the participating higher education institutions.

Accelerators are organisations that emerged in response to the shortcomings of incubators and aim to accelerate successful start-ups and venture creation through an intensive program for a limited duration (Wright, Siegel & Mustar 2017). Interviewee PS4, an external mentor in entrepreneurship, added:

“Creating a facility like an incubator with working space, professional services, workshops and skill training is helpful. But it can also be a bigger step like an accelerator program. Students get to commercialise their idea or scale-up the business through a 10–12-week accelerator program. I think private institutions have a responsibility to create these platforms and provide students that intensive coaching. Also, on the other hand, if they are really good, they can secure seed funding through the program and that’s a big relief for new entrepreneurs. This is the support; institutes should offer their students to really engage in and get their hands dirty.”

External stakeholders including entrepreneurs and mentors expressed that accelerator programs help students to grow as entrepreneurs and develop their start-ups.

According to the HEEE study by Miller and Acs (2017), an accelerator can be part of the local entrepreneurial ecosystem which higher education institutions reach out to for specialised services. Interviewee EE1, a second-generation entrepreneur and co-founder of a global brand, revealed:

“External stakeholders bring in practical knowledge and resources that can be used in different ways. Institutes commonly invite us as speakers for a one-time show. But they can also make these stakeholders a part of an accelerator program. I am currently part of an accelerator and there is some intense work that’s being done. I have witnessed how young entrepreneurs move to the next level with the support of more experienced entrepreneurs who have failed and succeeded. They do not leave the program with the same attitude for sure. But this accelerator is not attached to an institute and I haven’t heard of an institute that runs an accelerator program.”

In the case where a higher education institution is unable to host and operate an accelerator program in-house, students should be directed to such programs externally through the institution.

8.9 Chapter summary

This chapter presented the second half of findings for the second research question. Sections 8.2 to 8.6 provided the analysis and findings for codes that emerged during the content analysis on how HEEEs can operationalise mechanisms towards students E&I capabilities. Eighteen different mechanisms are suggested by internal and external stakeholders towards six contextual factors of HEEEs. The contextual factors and corresponding mechanisms are:

- (1) Entrepreneurial orientation – commit senior leadership to developing student E&I capabilities, foster entrepreneurial culture within the higher education institution, and empower staff with the responsibility of entrepreneurial initiatives
- (2) Entrepreneurship and innovation education – offer E&I education to all undergraduate students, apply a practical-oriented pedagogy for delivering E&I education, and engage students in real-world assessments
- (3) Entrepreneurship and innovation research – encourage students to practice applying research through coursework, expose students to acquiring scientific knowledge through research conferences, and offer opportunities for students to research start-up projects
- (4) Enterprise experiences – create access to entrepreneurship competitions at institution, inter-institutional and/or national level, offer internship opportunities with start-ups in a range of different industries, and provide start-up projects through the institution or external organisations
- (5) Entrepreneurial networks – engage students with peers interested in entrepreneurship at institution and inter-institutional levels, connect students to alumni who have succeeded and failed in entrepreneurship, and create ways for students to connect with various external stakeholders
- (6) Entrepreneurial support – offer students mentoring with practitioners including start-up entrepreneurs, provide students with a fully-fledged incubator, and, internally or with external support, leverage students through accelerator programs available privately or nationally.

These mechanisms lead to explanations of how higher education institutions can implement contextual factors for the development of students' E&I capabilities. This section of findings is underrepresented in HEEE literature and advances knowledge and understanding of operationalising HEEEs in resource-constrained environments. Given the resource-constrained environment, such mechanisms encourage HEEEs to evolve beyond their standalone nature and connect with external stakeholders in wider entrepreneurial ecosystems.

CHAPTER 9: FINDINGS AND ANALYSIS FOR RESEARCH QUESTION 3

9.1 Chapter overview

This chapter relates to the last research question, exploring how diverse stakeholders engage in the factors of HEEEs that could influence students E&I capabilities in a resource-constrained environment. Findings from this research question intend to determine avenues for higher education institutions to foster stakeholder engagement to influence students E&I capabilities within the context of HEEEs. When designing or revising their HEEEs, higher education institutions need to identify relevant stakeholders, understand their shared value and recognise the relationships that contribute to developing students' capabilities for E&I. This knowledge enables institutional management to co-create and evolve their HEEE to understand stakeholder engagement within the contextual factors that benefit the E&I capabilities of students. The structure of this chapter is presented in Figure 9.1.

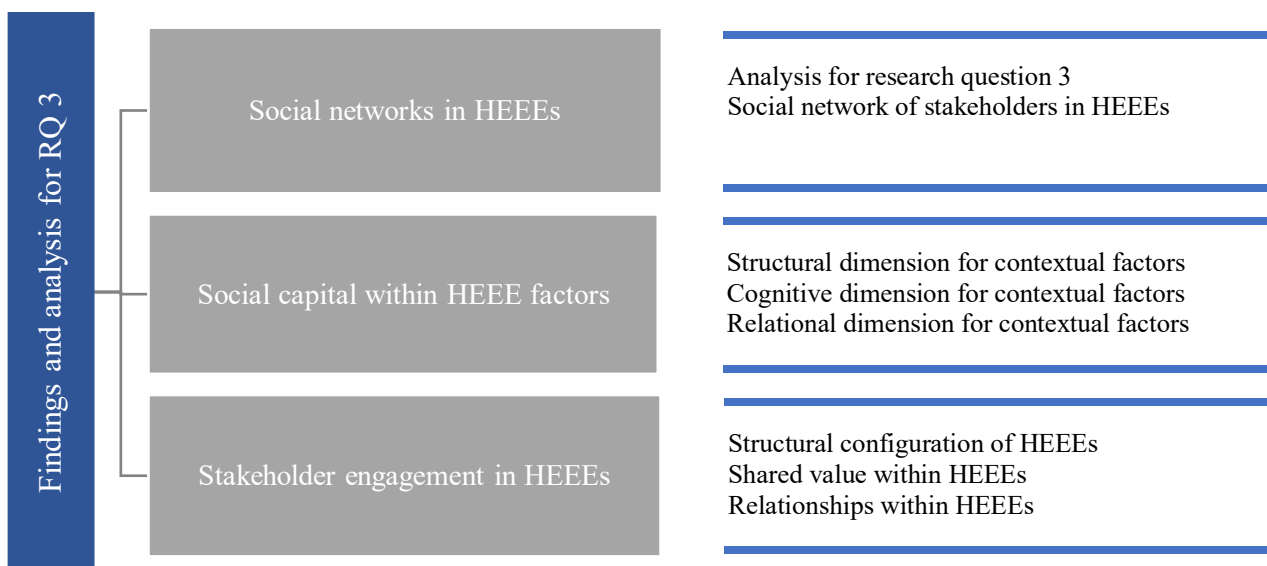


Figure 9.1 – Chapter 9 outline

9.2 Analysis of diverse stakeholder perspectives on stakeholder engagement

Through multi-stakeholder perspectives, the final research question explores stakeholder engagement within the six contextual factors leading to student development in E&I within HEEEs. In the first round of interviews, data were coded for stakeholder engagement. During the second round of interviews, data related to social capital dimensions emerged as opinions related to structural, cognitive and relational social capital. In the process of analysing and interpreting the data, a three-level data structure was developed, moving from interview data to theoretical interpretation (refer Figure 9.2).

Coding was attached to participant opinions and viewpoints, defining the initial codes and making sense of the data gathered. These initial codes are based on general aspects such as ‘stakeholders’ reflecting on their experiences with students, higher education institutions, HEEEs and entrepreneurship. Then, initial codes were consolidated into expanded codes based on more abstract concepts of related theory. For example, ‘internal and external stakeholders’ were identified as ‘ecosystem actors’. Finally, these expanded codes became the aggregated themes relating to social capital theory, and specifically social capital dimensions. In this case, ‘ecosystem actors’ related to structural social capital.

In this sense, higher education institutions can use ‘ecosystem actors’, ‘network ties’ and ‘ecosystem configuration’ to develop HEEE structures to empower stakeholder engagement and thus ‘structural social capital’ is the first dimension. Within ‘cognitive social capital’, various forms of shared value including ‘shared goals and purpose’, ‘shared knowledge and understanding’, ‘shared values and culture’, ‘shared language and narratives’ and ‘shared identity’ identified the resources that provide the system of meaning among different stakeholders in the HEEE. Finally, ‘relational social capital’ is a combination of parameters including ‘obligations and expectations’, ‘trust and respect’, ‘norms’ and ‘reciprocity’ that represent the nature of quality of relationships between stakeholders in the HEEE.

RQ3: How can diverse stakeholders engage in the factors of HEEEs that could influence students E&I capabilities in a resource-constrained environment?

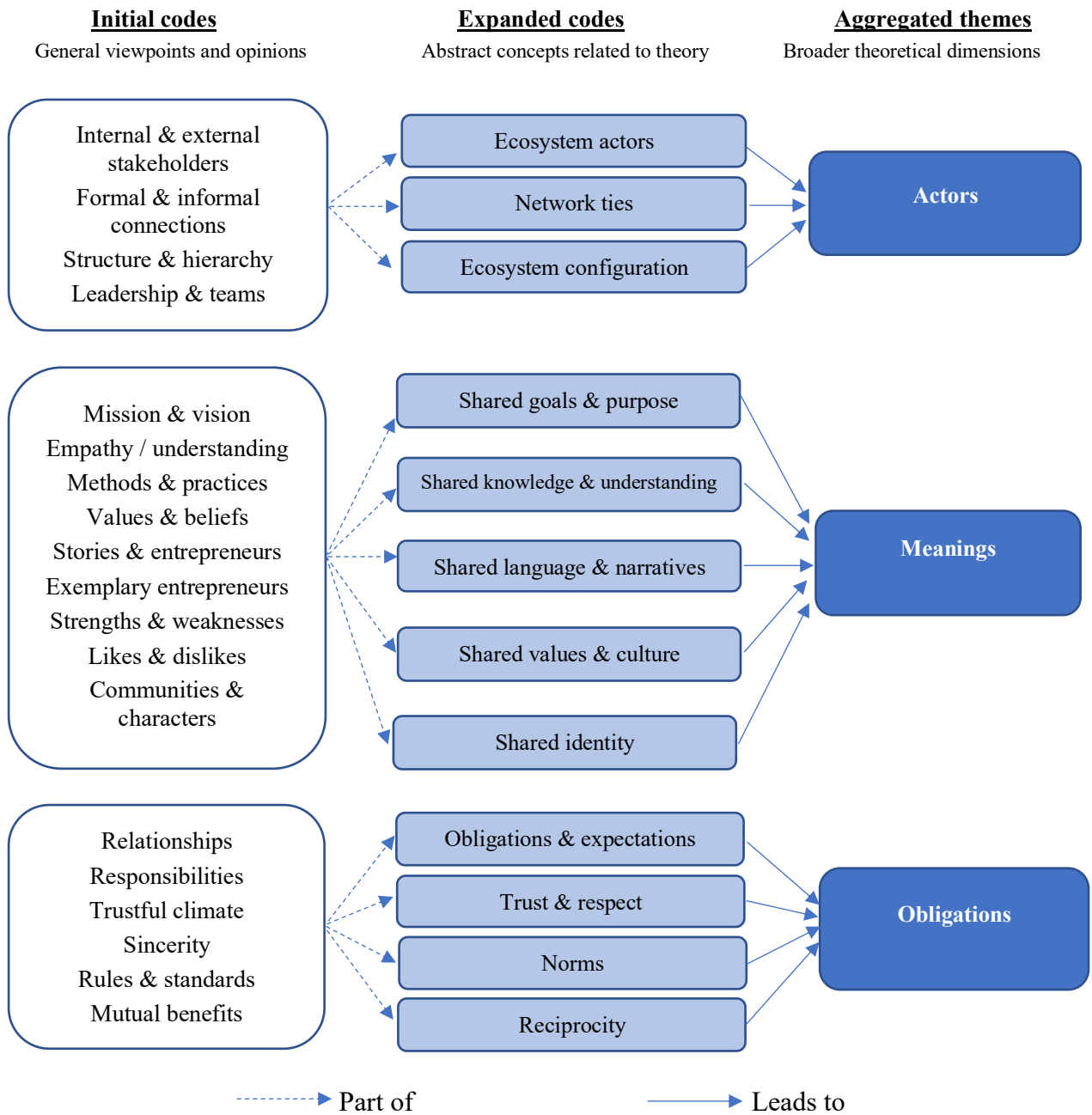


Figure 9.2 – Theme structure for research question 3

In this chapter, the social network is reported first, suggesting the ‘actors’ that can collaborate with the HEEE for developing students’ E&I capabilities. The next section describes the structural, cognitive and relational social capital related to the six HEEE contextual factors. In the final section, stakeholder engagement is presented, paying attention to structural configuration of HEEEs, shared value and relationships within HEEEs. These three sections answer the final question on how diverse stakeholders can engage within the HEEE, contributing to students E&I capabilities.

9.3 Social network of stakeholders in HEEEs

Participants shared their opinions on their social networks; that is, who was currently involved in HEEEs and who they perceived should be involved as key stakeholders of HEEEs. Based on the content analysis, 12 categories of stakeholders important to HEEEs in a resource-constrained environment were identified. These categories could be further understood as internal and external stakeholders that emerged as the social network. Internal stakeholders are institutional management, educators, staff representatives and students, while external stakeholders are other higher education institutions, entrepreneurs, alumni, financial institutions, angel networks, service support providers, corporates, not-for-profit organisations and parents. Some of these stakeholders are common to HEEEs, while a few, such as other higher education institutions and private companies, are unique to the resource-constrained context. Developing E&I capabilities requires the involvement of the larger community and wider entrepreneurial ecosystem (Bischoff, Volkmann & Audretsch 2018).

9.3.1 Institutional management

If higher education institutions are to use their HEEEs to become entrepreneurial, there needs to be an entrepreneurial drive from the top: namely, senior management. A strong viewpoint among external stakeholders was that management positions within institutions need to commit and lead entrepreneurship. In essence, higher education institutions need their management to set objectives and endorse strategies that promote an entrepreneurial culture and develop students’ capabilities for E&I. Institutional management including chief executive officers, department heads and deans/heads of school are key stakeholders in HEEEs who act as role models, initiating, advocating and leading E&I.

9.3.2 Educators

Educators continue to be significant stakeholders of HEEEs where internal and external stakeholders value entrepreneurship education. This research included educators in entrepreneurship, confirming that all six higher education institutions had academics responsible for delivering entrepreneurship or subjects related to entrepreneurship. A fundamental challenge for students and institutions is that their educators may have work experience but not experience in entrepreneurship. Educators may need to come from the field of entrepreneurship research while perhaps not having been an entrepreneur, they have a deeper understanding of the field. External stakeholders including entrepreneurs and investors suggest that educators should have entrepreneurship experience, even when delivering theory-related content to students. Further, there was consensus that educators should play an active role in other contextual factors such as entrepreneurial orientation, E&I research and entrepreneurial support in addition to the education element.

9.3.3 Staff representatives

In addition to senior management and educators, staff can promote entrepreneurship among students. For example, an industry liaison manager could be involved in value-added services. These staff representatives bring in additional effort to empower entrepreneurship initiatives within HEEEs. Two out of six higher education institutions have this practice in place, where such staff oversee various internal activities involving students. Among the six contextual factors of HEEEs, staff representatives can contribute to managing student participation in entrepreneurship competitions outside the institution (enterprise experiences), administering student communities, organising networking events (entrepreneurial networks), facilitating mentoring with entrepreneurship mentors and leading incubator programs (entrepreneurial support). This includes breaking away from limiting students to internal initiatives and giving them access to external programs and platforms with the support of staff representatives.

9.3.4 Students

While HEEEs serve the higher education community including academics, staff and alumni, students tend to be the central focus of higher education institutions. A portion of youth enter higher education institutions to pursue a career that inspires and interests them after undertaking an undergraduate degree. Higher education institutions in Sri Lanka predominately focus on teaching students to become proficient employees to take on corporate careers, instead of successful entrepreneurs. However, educators pointed out that there is a growing population

of students keen on entrepreneurship in their classes. These students represent a fraction of the Sri Lankan competitive talent and can be potential entrepreneurs that go on to the entrepreneurial ecosystem. In this case, students undergo a transition through their experience in the HEEE, developing their E&I capabilities.

9.3.5 *Other higher education institutions*

Higher education institutions tend to collaborate with other institutions in Sri Lanka for various events including sports and entertainment. However, higher education institutions with an entrepreneurship focus that participated in the study did not express any affiliations with other institutions or public universities for entrepreneurial activities such as competitions, networking events and incubators or accelerators. In some instances, public universities in Sri Lanka have access to more resources and is discussed later in this chapter. A higher education institution or public university with incubator facilities can share their resources with students from other institutions. Another higher education institution active with their network of potential student entrepreneurs can connect with similar students and network with other institutions. Higher education institutions can collaborate and support each other in resource-constrained environments.

Further, as higher education institutions in Sri Lanka closely work with international universities offering affiliated study programs, external participants expressed the desire to strengthen HEEEs through these relationships. These international collaborations can play an important role since universities from resource-rich environments can share resources and opportunities with affiliated partners to some extent. Although their best practices may not work as well for HEEEs in resource-constrained environments, such cooperation can expose students beyond their local settings. Other higher education institutions, local and international, joining forces towards developing students with capabilities can strengthen their respective HEEEs.

9.3.6 *Entrepreneurs*

Most participants emphasised the importance of entrepreneurs for HEEEs, identifying them as key stakeholders with a strong influence on developing students' capabilities in E&I. Their role in the HEEE is particularly important due to their experience in entrepreneurship and strong ties with the entrepreneurial ecosystem. The interviews revealed that entrepreneurs could be alumni, start-ups or established entrepreneurs. However, it was pointed out that entrepreneurs in the early or growing stage of their ventures should be in close in contact with students. These

entrepreneurs may have more ability to engage and see greater value compared to mature and established entrepreneurs whose start-up experience is likely to be from more than five years ago. Another view from multiple participants was that students should receive exposure from entrepreneurs of various paths, irrespective of whether they have had a higher education and if they have experienced some form of entrepreneurship and have experience to share. Currently, higher education institutions mostly welcome mature entrepreneurs who have a success story to share with students for inspiration.

9.3.7 Angel networks

Interaction between higher education institutions and angel networks are almost non-existent within this HEEE context. Angel investors are individuals or companies who provide financial capital for a start-up or SME, usually in exchange for ownership equity or convertible debt. Participants from angel networks express their strong willingness to work with higher education institutions to sustain their HEEEs and not just develop their students. HEEEs can benefit from various provisions of support from angel networks including E&I education, entrepreneurial networks and entrepreneurial support. Investors from angel networks evaluate business pitches presented by potential entrepreneurs and their capabilities to pursue the entrepreneurial journey. Angel investors are useful expert advisors on developing curriculum and assessments for entrepreneurship, and are resource personnel for networking activities, mentoring, incubators and accelerators. In addition to their formal duties, investors claim that they attend various entrepreneurship-related competitions organised by third parties to evaluate new business ideas and business pitches but rarely interact with institutions.

9.3.8 Start-up support service providers

Start-up support service providers can be highly diverse and are identified as support professionals who offer advisory services and organisations with infrastructure, including fully functional co-working spaces and incubators. Support services can be sponsored, voluntary or paid depending on the arrangement and requirement. Although such start-up support service providers are beneficial for higher education institutions in resource-constrained environments, there is no widespread linkage between the two parties. Higher education institutions appeal for such entrepreneurial support within their HEEE but this need is not limited to only one factor. These support service providers can play an important role in making students aware of important areas that they should pay attention to such as company statutory requirements,

regulatory requirements and governance. Without this practical knowledge, potential entrepreneurs lack the capability to secure funding and investments for their start-ups.

9.3.9 Private companies

Currently, there is minimal linkage between HEEEs and private companies although higher education institutions have partnered with companies for other educational purposes. Both internal and external participants pointed out the need for support from companies for HEEEs to effectively function in resource-constrained environments. Companies in this case can be from a wide range of industries including large multinationals that can offer resources to HEEEs focused on students' E&I capabilities. This stakeholder group does not include start-ups and SMEs.

Private companies can support HEEEs with various contextual factors including E&I research, enterprise experiences and entrepreneurial support. HEEEs can work with companies for mutual benefit while developing students' E&I capabilities. It came to light that some top multinationals in Sri Lanka have introduced entrepreneurial support programs for selective higher education institutions, but one challenge was that some support was exclusive to the HEEE. In this case, higher education institutions are urged to support a proposal that aligns with the respective company intending to build long-term relationships.

9.3.10 Financial institutions

None of the higher education institutions reported interactions with financial institutions for the purpose of supporting their HEEE. Financial institutions of private and public origin can collaborate directly with higher education institutions or indirectly with support through funding. This financial support can be in the form of sponsorships, seed funding and loan schemes. Such support can offer students programs various enterprise experiences and entrepreneurial support, while developing E&I capabilities. Financial institutions are known for various initiatives like financial aid for good causes and acts of corporate social responsibility. In addition to funding, financial institutions sometimes provide guest speakers for financial-related topics in start-ups and panel members for entrepreneurship competitions.

9.3.11 Not-for-profit organisations

Non-for-profit organisations and public universities are working together to accelerate entrepreneurship within higher education. However, private higher education institutions that participated in the study did not express any linkages with non-for-profit organisations for the

purpose of promoting entrepreneurship among their students. By nature, private higher education institutions have limited contact with such organisations. Both internal and external participants expressed that HEEEs can gain from external support towards the national priority of developing students with E&I capabilities.

As HEEEs are part of the wider entrepreneurial ecosystem, a focus on creating local and national partnerships with non-for-profit organisations is considered significant. Such organisations include chambers of commerce, and chambers of young Sri Lankan entrepreneurs and youth business Sri Lanka. Some external participants expressed that higher education institutions are not open for engagement in most instances and should initiate formal communications with such non-profit organisations.

9.3.12 Parents

Some entrepreneurs and support professionals argue that more higher education institutions should offer relevant entrepreneurship education by identifying different undergraduate groups. For instance, in Sri Lanka it is common for the younger generation to follow their parents and join the family business, resulting in next-generation entrepreneurs. These family businesses want to grow by launching new products, entering new markets and even diversifying. Their children with E&I capabilities, next-generation entrepreneurs having the ability to bring innovation to their family business are likely to lead towards higher performance and revenue. Such family business-oriented parents seek suitable entrepreneurship education for their children. However, most business degrees offered are limited to business management and business administration. These degrees include a minimal extent of entrepreneurship such as one subject.

Participating higher education institutions give minimal importance to parents within their HEEEs as they only appear to be key target audiences of marketing communications. In this case, HEEEs lack consideration of external influences such as parents of students. Parents are identified as an influence on the entrepreneurial intention of students (Webber, Kitagawa & Plumridge 2020). Further, family social capital is found to play an important role for startups in resource-constrained environments (de Brito, Lenz & Pacheco 2022). Through this study, parents are recognised as a key stakeholder group that hold high interest in their children's education and play a decision-making role in their children's career choices. Higher education institutions can benefit from engaging with parents and keeping them satisfied. Thus,

this appears as another point where HEEEs are disconnected from their wider entrepreneurial ecosystems.

9.3.13 Mapping social networks in HEEEs

The previous chapter highlighted six contextual factors as the composition of HEEEs that could influence student E&I capabilities in a resource-constrained environment. As discussed above, the 12 identified stakeholder groups play an important role and contribute to HEEEs by igniting inspiration, sharing knowledge, providing resources, offering advice or information, and leading E&I capabilities among students. Each stakeholder group of the social network is mapped against the six contextual factors of HEEEs in resource-constrained environments below in Table 9.1. It is apparent from the table that internal stakeholder needs to drive entrepreneurship within the HEEE, educators can be involved beyond E&I education, and external stakeholders can leverage enterprise experiences, entrepreneurial networks and entrepreneurial support for students. Students are involved in each contextual factor as they experience the HEEE.

Table 9.1 – Mapping social networks against the HEEE contextual factors

	Entrepreneurship orientation	Entrepreneurship & innovation education	Entrepreneurship & innovation research	Enterprise experiences	Entrepreneurial networks	Entrepreneurial support
1. Institutional management	<input checked="" type="checkbox"/>					
2. Educators	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>
3. Staff representatives	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4. Students	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
5. Other higher education institutions				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
6. Entrepreneurs		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
7. Angel networks		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
8. Financial institutions				<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
9. Support service providers						<input checked="" type="checkbox"/>
10. Companies			<input checked="" type="checkbox"/>			
11. Not-for-profit organisations					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
12. Parents		<input checked="" type="checkbox"/>				

identifies that a stakeholder is relevant for a respective HEEE factor

While a social network primarily emphasises an institution’s network, social capital theory sees this network as a source of resources highlighting the value of relationships (Hayter

2013). Social capital is argued as the glue that binds social networks and the lubricant that energises network interactions (Powell & Smith-Doerr 1994). Further, social capital increases the likelihood of an individual becoming an entrepreneur and advances the entrepreneurial process (Baron & Markman 2003; Davidsson & Honig 2003; Sahasranamam & Nandakumar 2020). In social capital theory, social capital has been described as ‘structural’, ‘cognitive and ‘relational’. The structural dimension of social capital involves the people of the network that shape the structure and influence outcomes (Anderson & Jack 2002). The cognitive and relational dimensions seem similar, however cognitive refers to shared knowledge and understanding, whereas relational relates to affective behaviour among people (Anderson & Jack 2002). The three social capital dimensions of social capital theory are relevant for an HEEE to function effectively (Theodoraki, Messeghem & Rice 2018). The findings in this section suggests the social networks are useful to create and use social capital within HEEEs for higher education institutions. In this case, to better connect with relevant stakeholder groups and build affiliations that serve HEEEs. Social capital dimensions for each contextual factor are discussed next.

9.4 Social capital dimensions for entrepreneurial orientation

Within the first HEEE factor of entrepreneurial orientation, stakeholders discussed the senior leadership, entrepreneurial culture and entrepreneurship chair(s) as mechanisms to operationalise HEEEs. In this section, the three dimensions of social capital are discussed in relation to entrepreneurial orientation and its three mechanisms.

9.4.1 Structural social capital for entrepreneurial orientation

For entrepreneurial orientation, internal and external stakeholders emphasise that institutional management, educators and staff representatives primarily make up the internal actors of the social network. It is likely that an institution will be unable to co-create an HEEE without senior leadership or implement it without support from staff (Rice, Fetters & Greene 2014). Their internal drive is considered as the commitment to build a robust HEEE using leadership from the senior management and through a succession of staff responsible for entrepreneurship within the institution. The social structure inside the institution and network ties between the internal stakeholders play a crucial role in driving the institution from within towards entrepreneurship. The first HEEE factor emerging from this study; entrepreneurial orientation, is the only factor involving internal stakeholders while the rest include a combination of internal and external stakeholders.

Interviewee AI3, an angel investor working with young entrepreneurs: “... if you look at the US universities and compare with Sri Lanka. What do we lack? From my observations and experiences, we lack people from the top enforcing entrepreneurship or bringing about that change into the institute. If senior management does not value or embrace entrepreneurship, how can we expect the future generation to be aware of entrepreneurship and what entrepreneurship is about?”

Interviewee DH2, a head of school: “We have two entrepreneurship pillars appointed for the role of fostering the entrepreneurial spirit among students. These pillars are academics teaching entrepreneurship but also have a zest for entrepreneurship. Basically, their role is to promote entrepreneurship our students. The e-club is one of their responsibilities as well. Monthly they must report what has been achieved and discuss upcoming initiatives.”

Interviewee AC2, an academic in charge of an entrepreneurial initiative: “I feel in any institute, the top management has a very critical role to play. Because they are the people who actually set the culture organisation for the whole institute. So, if the leaders or the top management doesn’t cherish an entrepreneurial culture, if they are not really valuing the concept of entrepreneurship, I don’t think it is possible to implement entrepreneurship. So, if they have a shared mindset and mission, obviously, that would be spread over to the institute, because they are the people who set the tone for it. So that is one party. And obviously the next party, I can say it’s the faculty members of the teaching faculty, because they are the interface between the students and the top management.”

9.4.2 Cognitive social capital for entrepreneurial orientation

In actively driving entrepreneurship within the institution, a shared sense of vision and mission plays a significant role by bringing everyone together towards a common goal and purpose in the institution. The involved employees, from senior management to selected employees, may adopt shared values causing a chain reaction and spreading the entrepreneurial culture throughout the institution. These shared attitudes and beliefs will continue to strengthen relationships as information relating to entrepreneurial initiatives flows through various channels among employees. Common knowledge and understanding can develop member perceptions, interpretations and representations for outcomes desired from the HEEE. Cognitive social capital for entrepreneurial orientation relates to shared goals, purpose, values,

culture, language and information that forms the background environment of the HEEE and behaviour of the people in the institution managing the HEEE.

Interviewee SP4, an external mentor in entrepreneurship: *“Especially in a country like Sri Lanka, it is not just about teaching entrepreneurship as a module or course. I believe that institutes should focus on developing that spirit, as well as that mindset, and you know, encourage an entrepreneurial culture within the student population. Of course, these shared values should come from the top and spread within the institute. This is mainly because entrepreneurship can happen at any point in their careers and life ...”*

Interviewee AI5, an angel investor: *“At university level, the culture must support it. If one joins a higher education institution today if that entrepreneurial culture does not exist, then there is no way for that student to really learn about entrepreneurship, be interested in such a career or develop the necessary capabilities. So, the culture of these institutions must drive their ecosystems. If you look at some of the popular universities that have successfully produced entrepreneurs and successful entrepreneurs are the ones that have that entrepreneurial culture nested within.”*

Interviewee AC1, an academic teaching entrepreneurship: *“So you look at the institute and whether we are encouraging our students to become entrepreneurs or not, I think it’s starts from our mission and corporate objectives. We have one objective focused on entrepreneurial development. From that, I will say we intend to support our students undertake self-employment if they wish too ...”*

9.4.3 Relational social capital for entrepreneurial orientation

Having established the structural and cognitive dimensions for entrepreneurial orientation, this section emphasises relational social capital. To actively drive the institution towards entrepreneurship, the relationships within the institution and with the wider entrepreneurial ecosystem becomes significant. Table 9.2 presents some of the obligations that stakeholders perceive higher education institutions can commit to. Senior management should recognise and celebrate entrepreneurial achievements that encourage relevant behaviour among employees. Using entrepreneurial culture, collective entrepreneurship goals can be associated with individual goals where each employee shares the group norms. Stakeholders also pointed out that higher education institutions can facilitate connections with a variety of internal and external stakeholders developing social relationships within the HEEE. The relational dimension for entrepreneurial orientation relates primarily to creating trust among

stakeholders, sharing norms, and strengthening the quality of relationships for the benefit of HEEEs.

Interviewee EE6, a social entrepreneur: *“How do institutions make a robust ecosystem and get people to serve that ecosystem? It can be done by bringing the separate people across different levels together. First, they need to solidify the internal aspect by building and coordinating the ecosystem at institution level. And culture can help with this a lot. Process wise it calls for sharing information, forming capabilities, and structuring the interactions needed to orient the institution.”*

Interviewee AE9, an alumni entrepreneur of a tech company: *“Most institutions still operate as separate with very limited interactions with the outside or limited in their purpose. But that’s not a successful approach for something like an ecosystem. Institutions can energise using the external stakeholders. The institution and its people need to put in effort to collaborate with stakeholders from the environment who can support and relationships need to be built on trust and shared values.”*

Table 9.2 – Social capital dimensions for entrepreneurial orientation

HEEE factor & mechanisms	Structural: actors of the social system	Cognitive: system of meaning	Relational: obligations and expectations
Entrepreneurial orientation Senior leadership Entrepreneurial culture Entrepreneurship chair(s)	<ul style="list-style-type: none"> • Institutional management • Educators • Staff representatives 	<ul style="list-style-type: none"> • Shared goals and purpose including vision and mission • Shared values and culture • Shared language 	<ul style="list-style-type: none"> • Recognise and celebrate entrepreneurship • Coordinate the ecosystem diffusing entrepreneurial culture • Facilitate connections with a variety of internal and external stakeholders

9.5 Social capital dimensions for entrepreneurship and innovation education

For the second HEEE factor, including E&I education, stakeholders emphasised entrepreneurship curriculum, practical pedagogy and real-world assessments as mechanisms within HEEEs. Below, the social capital dimensions are discussed in relation to E&I education and these mechanisms.

9.5.1 Structural social capital for entrepreneurship and innovation education

A combination of deans/heads of school, educators and entrepreneurs emerged as the actors relevant for E&I education. It was the viewpoint of multiple stakeholders that entrepreneurship as a field of study can break the traditional mode of an institution's academic operations and open it to the wider environment. This change highlighted the importance of involving practitioners, entrepreneurs who have launched a startup or are (or have been) involved in the entrepreneurial process, in various aspects of education. Only a combination of academics and practitioners can create the unique learning experience that entrepreneurship calls for. By joining these forces, higher education institutions can become more relevant to the growing student population keen on developing their entrepreneurship capabilities.

Interviewee SP2, a mentor promoting student entrepreneurship: *“Entrepreneurs learn from other entrepreneurs. That is the golden rule. That’s why individuals are keen to be in such a room where they can learn from people who have done it and feel comfortable asking questions. Majority of the time, students don’t ask questions in a normal classroom setting but when its driven by someone they can relate to learning becomes easier and interesting I would say ...”*

Interviewee AI6, an angel investor working with young entrepreneurs: *“Even if it’s a simple cupcake business, potential entrepreneurs need to have the basic knowledge of doing a business. From an education institute standpoint, the focus must be on providing education that gives students this essential knowledge. A lot of students come to us and what I see is that majority of them fail or show signs of failure because they fail to validate an idea whether there is an opportunity in that respective market. When tracing the problem, its goes to back their higher education of being highly academic.”*

9.5.2 Cognitive social capital for entrepreneurship and innovation education

Cognitive social capital includes shared knowledge and understanding from deans/heads of school, educators and entrepreneurs that flows within the social system. For E&I education, students are likely to learn better through subject and practical knowledge and develop stronger capabilities from a combined force of educators and practitioners. Such shared knowledge and understanding can be passed down beyond traditional lectures involving storytelling that situate the deeper understanding of the marketplace and industry. When education is taught in this way, it can cause students to start to create connections and relate shared knowledge to their own experiences and perceptions. These types of knowledge and understanding strongly

influence decisions and actions and work together for mutual benefit. In sharing subject and practical knowledge with students, entrepreneurs can bring industry insights related to entrepreneurship and make institutions more aware of the outer world; this in turn helps to develop the institutional portfolio of study programs and curriculums.

Interviewee EE1, a second-generation entrepreneur and co-founder of a global brand: *“I’ve always looked at education, especially higher education, as ‘you learn to learn’. Education gives you the skill set, and it gives you the knowledge. For example, what they learn gives students the knowledge to structure a start-up, to structure their thoughts, to structure business plans, and it gives students a widened knowledge about the different aspects or different spectrums within a business. Most importantly, it gives students the necessary tools to keep learning, absorbing information, and present information and so on, which is integral to running a business or creating a brand.”*

Interviewee AI1, an angel investor working with start-ups: *“Entrepreneurs can be invited to get involved in structuring of study programs in entrepreneurship and selecting the content that needs to be essentially taught in these programs. They [entrepreneurs] can bring in the practical insights of what knowledge and skills students should develop, being at the receiving end of the supply chain. This exercise will bring a good balance of people including academics and practitioners to benefit students who may become potential entrepreneurs.”*

9.5.3 Relational social capital for entrepreneurship and innovation education

The above discussion recognised the actors of the social system and the meaning of the system for the contextual factor, E&I education. Next the affective element that involves obligations and expectations is explored (refer Figure 9.3). Such obligations strengthen reciprocity as higher education institutions strive to produce entrepreneurial talent in the entrepreneurial ecosystem. When higher education institutions collaborate with stakeholders beyond educators for E&I education, they develop relationships between the HEEE and their wider entrepreneurial ecosystems. Curriculum development must draw the participation of alumni and they are also a resource for various other activities including guest lecturing (Fetters, Greene & Rice 2010). Instead of creating entrepreneurship curriculums and limiting input to internal views, external stakeholders such as angel investors can be invited to be part of curriculum and assessment development by sharing their input on future graduate capabilities for entrepreneurship and innovation. In addition to involving alumni entrepreneurs in sharing

practical knowledge, students should be given opportunities to apply their learned theoretical knowledge in real-world assessments associated with start-ups.

Interviewee AE3, a young entrepreneur of a fitness start-up: *“during curriculum development or deciding on new [study] programs, the tendency is that these institutes they will look at another institute or university, and simply co-create more or less the same program. In doing that, they [higher education institutions] don’t pay attention to the cultural nuances and what it really means for the students when developing a program or curriculum. Instead doing this, they can have a group of practitioners that they turn to for input on curriculum development. Because building a start-up in the Silicon Valley is definitely not the same in building a company in Sri Lanka for multiple reasons starting from the limited resources ...”*

Interviewee EE4, an award-winning entrepreneur of a social venture: *“it is surprising to me how some of these entrepreneurship contents are taught in degrees by people who have not experienced entrepreneurship. For example, valuations of new business is taught to a class of undergraduate students by someone who has not even raised capital for a start-up. So, it’s one part for academics to come and represent the theory [in a classroom] but it’s very different to how theory is applied in the practical world. Again, the focus has to be show students the real world experience, the practical knowledge in addition to the academic knowledge.”*

Table 9.3 – Social capital dimensions for entrepreneurship and innovation education

HEEE factor & mechanisms	Structural: actors of the social system	Cognitive: system of meaning	Relational: obligations and expectations
<p>Entrepreneurship and innovation education</p> <p>Entrepreneurship curriculum</p> <p>Practical pedagogy</p> <p>Real-world based assessments</p>	<ul style="list-style-type: none"> • Deans/heads of school • Educators • Entrepreneurs • Angel networks 	<ul style="list-style-type: none"> • Shared knowledge and understanding through theoretical knowledge, practical knowledge and industry insights 	<ul style="list-style-type: none"> • Share insights on future knowledge, skills and abilities for curriculum/program development • Deliver a combination of theoretical and practical knowledge • Create opportunities for practical application of knowledge

9.6 Social capital dimensions for entrepreneurship and innovation research

In the third HEEE factor involving E&I research, stakeholders highlighted research-based coursework, research-based projects and research conferences as mechanisms to implement research within HEEEs. Below, social capital's structural, cognitive and relational dimensions are discussed concerning E&I research and these mechanisms.

9.6.1 Structural social capital for entrepreneurship and innovation research

Within this factor, knowledge and understanding can be accumulated through research-based coursework, research-based projects and research conferences involving the contributions of various stakeholders. Interviewees identified educators, entrepreneurship associations, entrepreneurs and research companies as actors significant for E&I research within an HEEE. This is another HEEE factor that depends more on external ties than internal actors as the focus is inclined towards applied research. While educators can promote opportunities for research, other external stakeholders can step in to facilitate research. Applied research requires access to the community's knowledge associated with entrepreneurship such as entrepreneurial opportunities (Brush 2014).

Interviewee SP3, a professional providing advisory input to entrepreneurs: "I think there is a fair extent of research and some data is already available. So, associations like Chambers of Commerce can play a role in providing insights to students into a different industries, like emerging sectors or import sectors. In the same way even private research companies can come forward to share some their knowledge with these students for entrepreneurial purposes."

Interviewee EE5, an entrepreneur of a fashion start-up: "Lecturers can also take initiative to familiarise students with applied research. They can identify some data that is needed for an assignment and approach research companies to provide some information. It is naturally tough for individual students to reach these places on their own but for academic purposes it is possible. So, I think the start-up ecosystem is very helpful and there is a positive attitude towards entrepreneurs. It's only a matter of making the right connections to bring these benefits for students."

9.6.2 Cognitive social capital for entrepreneurship and innovation research

Cognitive social capital for E&I research relates to shared knowledge and understanding through market and business needs, industry insights and scientific knowledge. These

information resources provide meaning to the system for students to investigate and pursue entrepreneurship. Social cognition through research allows students to process and use information in an entrepreneurial context. It can improve capabilities such as research skills, and it further enables students to communicate and speak the same language as potential entrepreneurs. This common lexicon is significant for social interactions when students engage in entrepreneurial initiatives and work with practitioners.

Interviewee AC2, an academic in charge of an entrepreneurial initiative: *“It doesn’t have to be exact statistics or anything confidential. Just to open their [students] minds to what is currently happening in markets and industries so some customer information, market trends and business needs will help them [students] to think practically. This is the kind of assignments they need to work on rather than hypothetical situations and scenarios.”*

Interviewee SP3, an external mentor in entrepreneurship: *“Research is very very crucial in entrepreneurship. Because information and data are key. Back in the day, we have heard about gut-feeling in taking decisions. But things have changed, and anything related to the product, market, competitors, environment and especially a new start-up is research driven. I have seen start-ups fail when they are built on poor research, especially market research.”*

9.6.3 Relational social capital for entrepreneurship and innovation research

In the case of relational social capital, developing capabilities in research for E&I and promoting applied research approaches among students can lead to sharing knowledge and understanding of markets and industries (refer Table 9.4 below). Stakeholders claim that this knowledge exchange develops relationships based on mutual trust and respect. In some instances, this interconnection drives entrepreneurship within the HEEE, influencing student E&I capabilities.

Interviewee SP3, an external mentor in entrepreneurship: *“So, it’s an important skill [research skills] in planning, launching and managing a start-up. I would say research skills is among the top five skills for a successful entrepreneur. For student entrepreneurs, research is the starting point of their start-up.”*

Interviewee AE1, an alumni entrepreneur founded tech start-ups: *“Research plays a major role in entrepreneurship. Students nowadays should apply research through*

their assignments and coursework. Institutions should promote applied research approaches among students. Because when you are an entrepreneur, you need to know everything related to your business functions, industry trends, everyday challenges, and even what's happening internationally. That's what improves your knowledge and understanding to run the show when one is in this entrepreneurship game. Then it helps that an entrepreneur apply research in everyday business decisions ...”

Table 9.4 – Social capital dimensions for entrepreneurship and innovation research

HEEE factor & mechanisms	Structural: actors of the social system	Cognitive: system of meaning	Relational: obligations and expectations
Entrepreneurship and innovation research Research-based coursework Research-based projects Research conferences	<ul style="list-style-type: none"> • Educators • Entrepreneurs • Entrepreneurship associations • Research companies 	<ul style="list-style-type: none"> • Shared knowledge and understanding through market and business needs, industry insights and scientific knowledge 	<ul style="list-style-type: none"> • Develop students' skills and knowledge in research for entrepreneurship and innovation • Promote applied research approaches among students

9.7 Social capital dimensions for enterprise experiences

9.7.1 Structural social capital for enterprise experiences

Start-up entrepreneurs, other higher education institutions and private companies can facilitate enterprise experiences for students within the HEEE. These actors emerged as the top three network ties that describe linkages with external stakeholders beyond the institution. External stakeholders expressed their willingness to participate in respective HEEEs of higher education institutions, which established that the local entrepreneurial ecosystem is supportive of HEEEs. Higher education institutions can develop their network members by collaborating on mutual agreements or formalising these relationships through a memorandum of understanding. Developing network ties and connectivity makes it easier for institutions to evolve and engage in mutually beneficial collective actions for the HEEE.

Interviewee AE2, a young entrepreneur with a service-oriented start-up: *“higher education institutions can actually do something to break the current practice of the bigger companies coming in, promoting their internship programs and taking the cream of the crop. Then they [institutions] can also attract successful start-ups to the ecosystem. Because currently these start-ups find it challenging to access university*

students. The benefit of course will be will for the students who get an early start and experience working for a start-up. In return the start-ups get access to good talent to work with and they [student] might spin off some good ideas as well.”

Interviewee DH1, a dean of academic affairs: *“Today some of the bigger companies like the multinationals are coming forward with various opportunities for students. I think as part of their entrepreneurship and innovation within the company they are investing large amounts of money to attract ideas from young talent. These are excellent opportunities for students if we [higher education institution] connect with the right companies.”*

9.7.2 Cognitive social capital for enterprise experiences

Students may create and use different types of social capital from activities outside the classroom and higher education institutions. For instance, when participating in entrepreneurship-related competitions, or undertaking an internship or start-up project, students move into distinct environments involving social interactions with entrepreneurs or similar. In these situations, they experience and learn shared language and develop communication skills as a potential entrepreneur. Further, enterprise experiences can orient students as potential entrepreneurs, empowering their efficacy towards entrepreneurship. This can lead to developing an identity as a potential entrepreneur, and drive passion, intentions and decisions. Such experiences also accumulate shared knowledge and understanding through market and practical knowledge.

Interviewee AE3, a young entrepreneur of a fitness start-up: *“yes you can learn about entrepreneurship but the best way to learn entrepreneurship is by doing it. It’s very hard to learn entrepreneurship only in a controlled environment like a classroom. Alumni or non-alumni entrepreneurs really need to be connected to these ecosystems providing these students interested in entrepreneurship the opportunity to learn in real situations and get to know the language in the real context.”*

Interviewee AC5, an academic teaching a career planning unit: *“something that I have seen overseas but not really common here [Sri Lanka] is where students get work experience during their higher education. For example, if these undergraduate students can take on a placement or an internship with a start-up for a year. They will be embedded in that dynamic environment of a start-up and be involved from the small*

activities like photocopying, printing to functional tasks like marketing and be exposed to challenges of entrepreneurship.”

9.7.3 Relational social capital for enterprise experiences

Stakeholders expressed their views on structural and cognitive social capital for enterprise experiences above. Relational social capital for enterprise experiences involves improving the quality of relationships among actors through obligations (refer Table 9.5). Higher education institutions can provide platforms such as competitions for students to showcase their entrepreneurial potential and capabilities. In addition to internal activities, students can be encouraged to participate in external events at inter-institutional or national levels. Such events should attract external stakeholders from entrepreneurial ecosystems, including representatives of various industries and sectors, to witness students' E&I capabilities. Students can also be exposed to entrepreneurship through enterprise programs, such as internships with start-ups and start-up projects. These social experiences contribute to students seeing themselves as potential entrepreneurs and developing an identity, including traits, abilities and norms.

Interviewee AE4, an alumni entrepreneur: *“There are a lot of private companies who are running their own business competitions, hackathons and similar competitions. But they limited within their mandate, meaning within the respective industry the company is in. If its DIMO then it's focused on the auto automobile industry and they interested on pitching for that industry. If they come across a creative idea they like, they fund that idea and support the student, and they will take that idea into that industry. Another company is John Keells. There are platforms and more emerging as well. So I think external players are supportive now and they are getting ideas from outside and grooming it within the organisation.”*

Interviewee SP1, an external mentor and coach in entrepreneurship: *“I am regularly invited to these pitching competitions organised by various institutions and associations. When investors or people like myself we go as the judge board, we witness the students entrepreneurial intention and not just their business idea. I have frequently experienced judges from the panel of judges picking a particular idea and giving a student an offer on the spot. And this is beyond the competition or who is selected as winners. So there are enough opportunities out there for students to benefit from.”*

Table 9.5 – Social capital dimensions for enterprise experiences

HEEE factor & mechanisms	Structural: actors of the social system	Cognitive: system of meaning	Relational: obligations and expectations
<p>Enterprise experiences</p> <p>Entrepreneurship-related competitions Internships with start-ups Start-up projects</p>	<ul style="list-style-type: none"> • Start-up entrepreneurs • Other institutions • Private companies 	<ul style="list-style-type: none"> • Shared knowledge and understanding through market knowledge and practical knowledge • Shared language • Shared identity 	<ul style="list-style-type: none"> • Offer platforms to students for showcasing their entrepreneurial potential and talents • Expose students to entrepreneurship through enterprise programs • Encourage students to gather enterprise experiences through external participation • Build entrepreneurial identity of students

9.8 Social capital dimensions for entrepreneurial networks

9.8.1 Structural social capital for entrepreneurial networks

As part of the social network in the HEEE, actors including students, other institutions, alumni entrepreneurs, investors and support professionals are essential. To develop the entrepreneurial community, networking opportunities should be created between students, other higher education institutions and external stakeholders. In addition to the interactions of students with educators, regular interactions among students with similar entrepreneurial interests from the same institutions (internal to internal), inter-institutional students keen on entrepreneurship (internal to external) and entrepreneurial practitioners such as alumni entrepreneurs (internal to external) should be encouraged through the HEEE. In terms of entrepreneurial networks, higher education institutions can bring in diversity and link students with various types of stakeholders that could benefit their development. Having different layers of networks together with the idea of inclusion can work well for the HEEE configuration.

Interviewee A11, an angel investor working with start-ups: *“Bringing in people whether it’s from the same institute or from outside even entrepreneurs who don’t necessarily come from an education background is a rich experience. All that matters is it is people who have built a business, raised capital, given employment, or brought money into the country. They [students] need to socialise with people who have walked the talk ...”*

Interviewee EE4, an award-winning entrepreneur of a social venture: *“student entrepreneurs inherit from their surroundings, especially from families, friends, their education and other networks. The changing point is usually from another human being or event, it could be something their younger days or during their education. So, I would recommend for institutions to give the right exposure, the right situations and with the right people for the students to learn themselves. This can even start with student communities where peers from the same or various institutes with common goals get together right.”*

Interviewee AC3, an academic teaching an entrepreneurship-related unit: *“Students should meet people beyond the normal campus setup. Of course, the day-to-day people they are in connect with are the deans, the heads, all of us [academics] and their peers and even some alumni. But I think it should be more of the external people so that students are exposed to external influences, outside their campus. I would say maybe investors, entrepreneurs and other experts would be ideal to get involved with students.”*

9.8.2 Cognitive social capital for entrepreneurial networks

Social capital is created and used primarily in social interactions and entrepreneurial networks as an HEEE factor that allows bonds, bridges and linkages between students and internal and external stakeholders. Storytelling and interactions with peers, alumni entrepreneurs and external stakeholders lead to shared language and narratives. These entrepreneurial networks can increase the likelihood of social support for both students and HEEEs. In addition to shared languages, engaging with diverse stakeholders helps students see themselves as potential entrepreneurs and develop a sense of shared identity as part of the entrepreneurial community. The strong sense of belonging and acceptance as ‘one of us’ is highly motivating for students. Finally, through various interactions with stakeholders, students gain access to shared knowledge and understanding, including specific and practical knowledge. Students may be motivated to ask specific questions of practitioners or similar in safe environments that are not classroom settings.

Interviewee AE8, an alumni entrepreneur within an online start-up: *“Institutions should be able to bring entrepreneurs to tell a great story, you know, be able to inspire students towards entrepreneurship, and then guide them to do what they need to. But majority of the entrepreneurs don’t fall into that success category, there are entrepreneurs who*

have failed, learnt and then succeeded. There are also entrepreneurs who have failed and moved in other directions. These success and failure stories should all be welcome. I personally feel there is a lot to learn from failure than success.”

Interviewee SP4, an external mentor in entrepreneurship: *“So institutions should identify the right people and connect students with those people. Of course, within the degree one can learn how to write a business plan, how to do a pitch, or how to manage finance and so on. Today this knowledge is largely available, even online. But meeting the right people is something very rare, students can be influenced to become an entrepreneur, trigger a creative idea and learn specific knowledge for their questions. Through such people, students can have opportunity to get membership into this entrepreneurial community.”*

9.8.3 Relational social capital for entrepreneurial networks

The above sections refer to the network of people and organisations enabling HEEEs to stimulate shared language and narratives, knowledge and understanding, and belongingness and community development. Relational social capital includes parameters that influence relationships within HEEEs (see Table 9.6). Higher education institutions can facilitate networking through the HEEE to create connections with stakeholders relevant to their entrepreneurial journey. Entrepreneurial networks will form start-up communities for networking with relevant stakeholders. Students can interact with entrepreneurs through these entrepreneurial networks, observe their characteristics, and learn from them. Social interactions between students and other actors from the entrepreneurial ecosystem allow building trust, respect and even friendships, which can carry forward for future endeavours. Further, networking inspires togetherness, a sense of belonging and community spirit, building collaboration among students and other stakeholders. This relational social capital results in social development through social bonds with people of shared identity such as peers and entrepreneurs. Students tend to build their self-confidence and entrepreneurial identity through their networks (Longva 2021).

Interviewee PS6, a mentor in entrepreneurship: *“I have come across young students who are entrepreneurial and have great business ideas. But they fall short because they don't have the networks. These don't have to be big networks, but they need access to networking opportunities. So, then they can build their networks and absorb relevant*

information. There is a lot of dynamics in the space of networking and its very high intense.

Interviewee AE6, a co-founder of a men’s fashion start-up: “So it is not just general networking but something more specific as well. First thing to build solidarity for his idea, he should build a networking circle around his business idea. Let’s see your innovation is related to the medical industry then he should get in contact with medical practitioners, pharmacies and medical research institutes. This is very important, and this is your start-up community. Through this circle the student will have access to various resources.”

Interviewee EE3, a second-generation entrepreneur: “Education is not just about going to university and learning the theory of some subject. But the exposure which is way beyond. Meeting people from the outside world, interacting with them, getting to know about the society, people’s behaviour, lifestyles and learning about environments. It’s really important for students to learn about the society and learn from the broader community. This is the kind of social learning and attitude that students should receive to prepare themselves for something as entrepreneurship.”

Table 9.6 – Social capital dimensions for entrepreneurial networks

HEEE factor & mechanisms	Structural: actors of the social system	Cognitive: system of meaning	Relational: obligations and expectations
Entrepreneurial networks Peer engagement Alumni networks External stakeholders	<ul style="list-style-type: none"> • Students • Other institutions • Alumni entrepreneurs • Angel networks • Support service professionals 	<ul style="list-style-type: none"> • Shared knowledge and understanding through specific knowledge and practical knowledge • Shared language and narratives • Shared identity 	<ul style="list-style-type: none"> • Facilitate networking • Provide social learning and resources • Build start-up communities • Build entrepreneurial identity of students

9.9 Social capital dimensions for entrepreneurial support

9.9.1 Structural social capital for entrepreneurial support

When focusing on the structural configuration of the HEEE, with particular emphasis on entrepreneurial support, actors such as entrepreneurs, investors, private companies and not-for-profit organisations are of interest. Similar to entrepreneurial networks, higher education

institutions can take into account the importance of network ties with external stakeholders for HEEEs. However, institutions can strengthen internal networks by expanding their role in entrepreneurial support as well. Through the structural configuration of HEEEs, higher education institutions can facilitate entrepreneurial support and draw on various benefits, including resources. HEEEs built on stronger ties with external stakeholders, with frequent interactions and closer interrelationships, can increase the level of entrepreneurial support that students can gain.

Interviewee SP5, an external mentor in youth entrepreneurship: *“I would say a mentoring process, more like an overall mentoring program that involves experienced entrepreneurs or entrepreneurship experienced professionals like investors engaging with these young students. But this word mentor is highly misunderstood. When we reach institutions, they say they already have mentors so what the difference. So, in entrepreneurship, a mentor is an individual who can elevate these students and show them their potential to become an entrepreneur. And there are different ways to mentor such a student who is interested in entrepreneurship.”*

Interviewee AE5, an alumni entrepreneur of a revolutionary start-up: *“I see the possibility for these educators take on the mentoring role. That way institutions can two ways of mentoring their students, internal and external mentors for their students is a more powerful approach. After all, these academics have close and ongoing contact with students, they have a trustworthy relationship and they can play a crucial role in improving their readiness. I am yet to see this kind of mentoring approach among private institutions but it can happen.”*

Interviewee AI2, an angel investor: *“These institutes can't offer all the support and they don't have all the networks in place. So, they [institutes] should open up to the start-up ecosystem and attract the support for their students. There are a few active angel investors taking various initiatives ...”*

9.9.2 Cognitive social capital for entrepreneurial support

Participating in mentor programs, incubators and accelerators allows students to repeat contact and dialogue with external stakeholders, building social capital through shared language. Higher education institutions are responsible for sustaining entrepreneurial support mechanisms and ensuring their purposes are effectively met. Stakeholders with mutual interest are willing to develop students' capabilities and support their entrepreneurial journey. This

engagement between students and stakeholders may reciprocate through shared goals and purpose. Through entrepreneurial support, stakeholders share knowledge and understanding for personal development, passing traits and values to students as offspring within the HEEE.

Interviewee AI4, an angel investor: *“So this mentor is entrepreneurial, and they can help to enhance these students’ capacity. It should be an engagement approach building the internal and external capacities of the mentee, that is the student. It is essentially personal development sharing knowledge on personality traits, social cues, and communication tips. This is what will help them get out there with confidence.”*

Interviewee PS1, an external mentor and coach in entrepreneurship: *“You see accelerator programs gives students expert advice. Whether it’s on business pitching, lean models, managing teams, attracting resources and others. Students who get this knowledge and experience can improve their scalable start-ups, ideas and concepts to market-ready product and services with more successful start-ups. Experts involved in such programs come from their own areas and fields which makes them experts in that area.”*

9.9.3 Relational social capital for entrepreneurial support

Stakeholders significant for entrepreneurial support and shared understandings are reported in Table 9.7 below. Relational social capital relates to the nature and quality of relationships held among students and different stakeholders. Entrepreneurs and experts in entrepreneurship can play the role of mentors by developing soft skills among students, including their personality, attitudes and abilities such as working with others. Through platforms like accelerators, entrepreneurs and investors are also willing to share advice and improve students’ practical knowledge on starting a new venture. In addition, private companies and not-for-profit organisations can support students as potential entrepreneurs by providing access to resources including financial funding or infrastructure support. The nature and quality of these relationships are expected to develop over time through continuous engagement and result in interpersonal trust and obligations between students and stakeholders, the HEEE and wider entrepreneurial ecosystem.

Interviewee AC5, an academic teaching a career planning unit: *“During their education journey, students look for people they can relate to and learn from. Of course, we are there as lecturers. I have come across a couple of students who are interested in becoming entrepreneurs. So, they look for that person they can talk to, someone like a*

mentor who can answer their questions, give them direction and learn everything entrepreneurship. Sometimes it is not the lecturers they look for. They have specific questions like how to become an entrepreneur, how it is like being an entrepreneur, how to improve themselves for it and things like that.”

Interviewee AI5, an angel investor: “If I am given the opportunity, I would like to mentor students who are aspiring to become entrepreneurs or even advice students in an incubator. In my capacity and others in similar positions we have a lot of knowledge to share. Students creating their start-ups can really benefit input on their business idea, model, market fit and start-up to see if they need any improvements or how they can tackle any challenges. Of course, it is not limited to this, mentoring can also be about their self-development.”

Interviewee EE5, an entrepreneur of a fashion start-up: “Students or young entrepreneurs lack all types of resources. I remember when I started out. And I think the best way around it is to collaborate and source those resources from your network and support system. The institutions, mentors and even outside organisations can bring together the resources you need for mutual benefit or sometime for no benefit at all.”

Table 9.7 – Social capital dimensions for entrepreneurial support

HEEE factor & mechanisms	Structural: actors of the social system	Cognitive: system of meaning	Relational: obligations and expectations
Entrepreneurial support Mentor programs Incubator Accelerator	<ul style="list-style-type: none"> • Educators • Entrepreneurs • Angel networks • Private companies • Financial institutions • Not-for-profit organisations 	<ul style="list-style-type: none"> • Shared goals and purpose • Shared knowledge and understanding for personal development • Shared language through expert advice and specialised knowledge 	<ul style="list-style-type: none"> • Mentor students on becoming successful entrepreneurs • Advice students on their business ideas, models and start-ups • Provide resources for creating start-ups

9.10 Stakeholder engagement in HEEEs

9.10.1 Structural configuration of HEEEs

The structural configuration of HEEEs includes factors and actors, in this case as it relates to actors being the social network. HEEEs, similar to entrepreneurial ecosystems, are multi-

stakeholder environments that consist of many stakeholders (Feld 2012; Fetters, Greene & Rice 2010). Designing HEEEs with relevant stakeholders is important as developing student E&I capabilities can benefit from stakeholders beyond the institution and from the wider entrepreneurial ecosystem (Bischoff, Volkmann & Audretsch 2018). In this research, higher education institutions are challenged by weak ties, structural holes, limited connectivity and low network stability of members in HEEEs.

An HEEE is directly influenced by its social network and higher education institutions along with their students can benefit from developing bonds, bridges and linkages with relevant ecosystem actors. It is also important to consider the inclusion of stakeholders beyond the institution in the HEEE as they are the receiving end of talent; that is, potential student entrepreneurs. With respect to the structural configuration of HEEEs, network members internally include institutional management, educators, selected employees who are staff representatives, and students. Externally, the social network can involve other higher education institutions, entrepreneurs, investors, start-up support professionals, private companies, financial institutions, not-for-profit organisations and parents. Higher education institutions need to fill the structural holes in the social structure of an HEEE by including a combination of internal and external members in the social network.

Both stakeholder groups, internal and external, recognise that co-creating and evolving an HEEE in a resource-constrained environment depends on strong connections, aligned stakeholders and teamwork involving the collaboration of stakeholders from the HEEE and the wider entrepreneurial ecosystem. A dominant point is the importance of actors in the entrepreneurial ecosystem being involved in HEEE factors such as E&I education and vice versa. The nature of these connections may vary according to the roles and relationships of each member. Unlike HEEEs in developed countries (Lahikainen et al. 2019), it is apparent that HEEEs are not self-sustaining in a resource-constrained environment and need to bridge with their entrepreneurial ecosystem, increasing their resource repertoire. However, these various network members and their synergies can lead to better E&I capabilities for students and greater network stability in the HEEE.

Involving the wider entrepreneurial ecosystem through collaborations such as knowledge sharing has allowed the development of students' capabilities and the creation of new start-ups (Carayannis & Campbell 2009). Close interactions between students and educators, companies and institutions create a favourable environment, seeding students with

knowledge, skills and experiences. In this research, external stakeholders urged higher education institutions to work together with stakeholders in the wider entrepreneurial ecosystem to stimulate students E&I capabilities. The social network a student inherits during their higher education journey might have a pivotal impact on their access to knowledge that facilitates their capabilities to identify and exploit opportunities as potential entrepreneurs. Creating these relationships with other stakeholders results in building social capital and fostering better connectivity for students.

Embedding HEEEs with relevant stakeholders can address specific needs, including resource constraints. Social embeddedness enables access to latent resources and resources otherwise not available (Jack & Anderson 2002). Embeddedness is a configuring element that involves understanding the nature of the structure, enacting this structure with new ties and sustaining both the structure and links in order to bring together the environment (Whittington 1992). In principle, embeddedness is actors embedded in ongoing systems of social relations and networks (Granovetter 1985). For example, HEEEs lack resident entrepreneurs who are available onsite at higher education institutions in developed countries, and in such resource-constrained environments alumni entrepreneurs can fill in and engage with students. When it comes to providing seed funds for start-up projects, HEEEs can seek support from financial institutions to sponsor new business ideas when they lack funding for such initiatives.

9.10.2 Shared value within HEEEs

While the structural dimension involves ecosystem actors, ties and configuration, the cognitive dimension relates to shared value. Concerning cognitive social capital, HEEEs lack common goals and shared meaning with their wider entrepreneurial ecosystem for the sustainability of HEEEs. Stakeholders suggested a variety of cognitive social capital including shared goals and purpose, shared knowledge and understanding, shared values and culture, shared language and narratives, and shared identity through social interactions within HEEEs. Shared knowledge and understanding are the most common types of cognitive social capital when operationalising the six contextual HEEE factors. All these cognitive schemes can be understood as shared value and can be envisaged as part of the embeddedness discussed above in the structural configuration of HEEEs.

Cognitive social capital establishes a better foundation for HEEEs by communicating the shared knowledge of functioning among stakeholders. Multiple stakeholders with mutual interests must work in sync, collaborating, coordinating and co-existing to drive students E&I

capabilities as a goal of HEEEs and the wider entrepreneurial ecosystem. Including external stakeholders and drawing on their shared value can make the HEEE and the wider entrepreneurial ecosystem stronger, resulting in individual and societal impacts.

With relevant stakeholders, internal and external, sharing their value in operationalising the HEEE factors that may lead to students developing their capabilities for E&I in a resource-constrained environment, such shared value can be twofold. Students in a resource-constrained environment are drawn towards entrepreneurship by internal capabilities and external support, and not necessarily by the desire for entrepreneurship (Lin et al. 2013). The effectuation process explains that at the starting point, entrepreneurs ask themselves questions such as ‘Who are we?’, ‘What do we know?’ and ‘Whom do we know?’ considering the current situation and resources at hand (Saravathy & Dew 2005). First, interactions with diverse stakeholders and building social capital can benefit students through ‘whom they know’ to pursue entrepreneurship in the long term. Students may seek out investors, with whom they then interact and create a relationship to assess their business idea and evaluate a business model. In a resource-constrained environment, where educators may lack entrepreneurial experience, students turn to practitioners outside their institution. Further, by asking ‘whom they know’, entrepreneurs convince themselves of a common future (Wiltbank et al. 2006). To develop self-efficacy, students may seek verbal encouragement and emotional support from individuals who are entrepreneurs. Especially in a resource-constrained environment, students rely on whom they know for their entrepreneurial endeavours.

Second, capabilities are driven by knowledge and theory traditionally taught in higher education. However, a variety of stakeholders shape the flow of E&I capabilities obtained by students (Spigel 2017). Being exposed to stakeholders beyond the institution might generate better value for students, such as more practical and social learning that is otherwise limited in the institution. For instance, entrepreneurs can pass on their personalities and behaviours to students as potential entrepreneurs to be innovative, create value and cope with challenges through innovation. Further, exposure to the open environment will add to students’ knowledge of tools and techniques for innovation. An entrepreneur must create, manage and assume the risk of a start-up, embracing the total innovative process (Cunningham & Lischeron 1991). Networking influences individuals and uses key people to achieve objectives (Santandreu-Mascarell, Garzon & Knorr 2013). In a resource-constrained environment, a well-connected HEEE can support creative thinking to develop students’ E&I capabilities.

9.10.3 Relationships within HEEEs

Having established the structural configuration and shared value in HEEEs, this section relates to the relationships among stakeholders within HEEEs. An HEEE with a focus on developing students' E&I capabilities can benefit from strong connections, shared goals and a high level of trust. The feelings of trust and respect that need to be shared by diverse stakeholders became prominent regarding exchanging resources within the HEEE. When working together, particularly across different yet connected contexts, higher education institutions need to pay attention to what and how stakeholders think and feel. Stakeholders within HEEEs need to interact with a variety of relevant stakeholders, strengthening existing relationships and forming new relationships. The quality and nature of relationships can be understood in the embeddedness discussed above regarding structural and cognitive social capital.

The co-creation, success and sustainability of HEEEs are deeply connected with the effectiveness of internal and external stakeholder relationships. In addition to economic development, higher education institutions are considered a driving force for community development (Reggiani 2017). Higher education institutions are a significant domain of the wider entrepreneurial ecosystem for their role in developing entrepreneurial talent (Isenberg 2010). Likewise, HEEEs affect their immediate environment and can build entrepreneurial communities. Entrepreneurial communities focus on developing entrepreneurs and take a systems approach to community development (Lichtenstein, Lyons & Kutzhanova 2004). Such communities include stakeholders who are actively engaged in developing students for entrepreneurship through know-how, support and resources.

Higher education institutions in resource-constrained environments can alleviate deficiencies in social capital through community engagement (Vohara et al. 2004). Events, projects and competitions taking place through the HEEE can act to bring cross-community groups together, including external stakeholders from the wider entrepreneurial ecosystem. This engagement can build connections with trust and respect, leveraging students through the HEEE and building connectivity that might not exist otherwise. Programs within HEEEs that deliberately leverage such opportunities offer the ability to access social capital in other localities (Bedó, Erdős & Pittaway 2020).

9.11 Chapter summary

An analysis of data and presentation of findings addressing the third research question on how diverse stakeholders can engage within the six contextual factors of HEEEs that could influence

students' E&I capabilities in a resource-constrained environment is included in this chapter. A three-level content analysis focusing on the data leading to theoretical dimensions was conducted at the beginning of this study. While stakeholder collaboration in entrepreneurship education has been investigated, stakeholder engagement within HEEEs is understudied. This study sheds light on social networks including 12 key stakeholders, contributing to the composition and configuration of HEEEs. Creating social capital considering its structural, cognitive and relational dimensions is revealed when operationalising HEEEs. Social capital increases the likelihood of becoming a potential entrepreneur, progressing through the start-up process, and avoiding start-up failure. This section brings together factors and actors in HEEEs with social capital that has the potential to strengthen the HEEE. In doing so, this study contributes to social capital dimensions by contextualising theory to HEEEs in a resource-constrained environment. The chapter ends with a section on the structural configuration, shared value and relationships for stakeholder engagement in HEEEs.

CHAPTER 10: DISCUSSION AND CONCLUSION

10.1 Chapter overview

This final chapter provides a discussion of the findings associated with the research questions, highlights the contributions to theory and implications for practice, and concludes with limitations of the study and future research directions (refer to Figure 10.1). This chapter demonstrates ‘what’ was known in the literature prior to this study and ‘how’ and ‘why’ thinking should be different because of this research. That difference constitutes the value added to the literature contributed by this research. In this case, the main objective of this chapter is to discuss key and new findings.

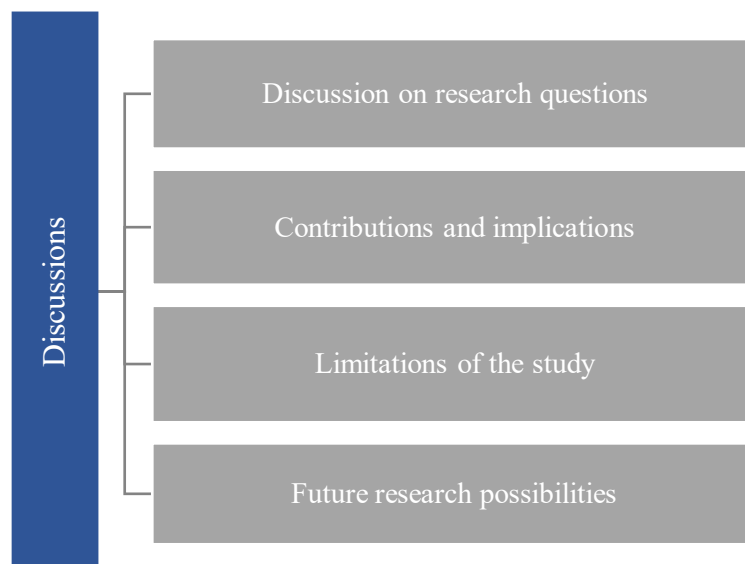


Figure 10.1 – Chapter 10 outline

10.2 Findings for each research question

Findings from the study reveal that higher education institutions in a developing economy, their HEEEs and their challenges and opportunities are different compared to developed economies. Therefore, context matters (Langowitz & Minniti 2007; Boettke & Coyne 2009; Autio et al. 2014) even in HEEEs and in this case, a resource-constrained environment, namely Sri Lanka as an emerging economy. This section discusses the findings relating to the research questions, outlining their relationships to theory and the HEEE literature, and explains the results.

10.2.1 Beyond student start-ups, entrepreneurial mindset and intention

The first research question inquired how diverse stakeholders anticipate the continued development of HEEEs in a resource-constrained environment. The objective was to understand the perceptions of internal and external stakeholders about the future of HEEEs in a resource-constrained environment through their lived experiences. Three overarching findings emerged from the qualitative analysis of interviews with deans/heads of school, academics, alumni entrepreneurs, expert entrepreneurs, angel investors and support professionals. These findings illustrate the relationship between HEEEs and students' E&I capabilities in a resource-constrained environment, through a view of the continued development.

Finding 1: For the continued development of HEEEs, higher education institutions need to focus on capability development, particularly E&I capabilities of students (see 6.3).

Finding 2: An HEEE is a sub-ecosystem of the wider entrepreneurial ecosystem affecting the overall performance of E&I (see 6.4.2).

Finding 3: There are different roles that HEEEs can play, including influential, developmental, networking, entrepreneurial and regional, to serve their purpose to students and ecosystem actors in the context of resource constrained environments (see 6.4.1).

Current literature considers the student somewhat at the heart of the ecosystem and discusses HEEEs that lead to start-ups, foster entrepreneurial mindset and encourage entrepreneurial intention (Longva 2021; Webber, Kitagawa & Plumridge 2020). The emergence of HEEEs has focused on start-ups for the most part (Longva 2021; Meyer et al. 2017; Wright, Siegel & Mustar 2017; Miller & Acs 2017; Rice, Fetters & Greene 2014). More recently, studies began exploring HEEEs at the individual level including entrepreneurial mindset and intention (Webber et al. 2020; Guerrero et al. 2020; Secundo et al. 2020). With this limited view of HEEEs, this study recognises the continued development of HEEEs to develop students' E&I capabilities. The concept of E&I capabilities represents skills, expertise, acumen and knowledge, terms interchangeably used in entrepreneurship literature (Liu, Kulturel-Konak & Konak 2021). E&I capabilities involve the ability of an entrepreneur to start and grow a new venture using a combination of resources (Gumsay & Bohne 2018). The importance of E&I capabilities is based on the rationale that youth with entrepreneurial aspirations require pre-venture capabilities to sustain start-ups. A recent report found that 'lack of skills and expertise' is a top reason to why start-ups fail in Sri Lanka

(PricewaterhouseCoppers 2020). Alumni entrepreneurs revealed ‘skills and expertise’ as the most important facilitating factor of successful start-ups. Angel investors and support professionals pointed out that ‘lack of market research’ and ‘insufficient business acumen’ are key issues that drive start-ups to fail and that these are capabilities that should be primarily developed during the education journey. Unlike prior HEEE studies that primarily focused on students’ start-ups, entrepreneurial mindset and intention, this study advances the HEEE literature by establishing the importance of developing students’ E&I capabilities. In this case, higher education institutions support students’ development, and the success of this transformation would be profound for the wider entrepreneurial ecosystem (Matriz et al. 2020; Birch et al. 2017).

The main theme explored in entrepreneurship education is reinforced in this study, the contention that capability development matters (Longva 2021; Webber, Kitagawa & Plumridge 2020; Guerrero, Urbano & Gajón 2020; Meyer et al. 2017; Wright, Siegel & Mustar 2017; Miller & Acs 2017; Rice, Fetters & Greene 2014). Higher education institutions must produce entrepreneurial capital and be catalysts for economic and societal development (Guerrero, Cunningham & Urbano 2015). E&I capabilities refer to the collection of knowledge, skills and attitude that contributes to one’s entrepreneurship-specific human capital profile (Ucbasaran, Westhead & Wright 2007). However, HEEEs should focus on achieving a series of entrepreneurial outcomes rather than focusing on a single outcome – whether it is E&I capabilities from this study or start-ups, entrepreneurial mindset or intention in previous studies. This study contributes to the missing link identified when mapping current HEEE studies against the start-up process for students by Duruflé, Hellmann and Wilson (2018). This means that in the future higher education institutions can rethink the co-creation of their HEEEs and focus on a sequence of entrepreneurial outcomes. Ideally, HEEEs when co-creating and evolving their HEEEs can align to the three stages proposed by Duruflé, Hellmann and Wilson (2018) where there are activities focused at (1) creating entrepreneurial mindset and intentions; (2) developing entrepreneurial knowledge and skills (capabilities); and (3) building start-ups.

An entrepreneur’s capabilities are known as inputs presumed to be related to outputs such as start-ups (Ucbasaran, Westhead & Wright 2008). This understanding comes from the systems perspective found in entrepreneurial ecosystems research (Stam 2015; Feld 2012; Isenberg 2011; Cohen 2006; Neck et al. 2004). This trend of HEEE literature focused primarily on student start-ups raises concerns about the primary purpose and tradition of higher education institutions that produce students for future work. In this case, higher education institutions

need to focus on developing the E&I capabilities of students, the potential entrepreneurs of the future, who may become successful entrepreneurs and transit into the economy and society. In moving forward, higher education institutions should focus on capability development through their HEEEs, taking the responsibility of a higher education institution. The role of entrepreneurship education and experiences extends beyond creating start-ups and into developing employability skills (Ustav & Venesaar 2018). Students with E&I capabilities and the desire to become an entrepreneur may take the ideal path of recognising an innovative business idea and creating a start-up. Other students may choose to work in an existing start-up or even work in organisations as an intrapreneur, that is, an entrepreneurial employee, creating new innovations such as business models, brands, products/services and even operational practices. Given that almost every industry has embraced entrepreneurship and innovation to varying degrees, students with E&I capabilities become relevant to all organisations.

Every HEEE delivers entrepreneurship education and supports new venture creation (Rice, Fetters & Greene 2014). However, such ecosystems not only cater to students aspiring to become start-up founders and those interested in learning about entrepreneurship but can also support students who are keen on intrapreneurship and want to include an entrepreneurial role by developing innovative ideas in a business. In developing countries, like Sri Lanka, where higher education institutions are primarily focused on nurturing jobseekers and catering to the job market, these institutions can rethink their ecosystem to promote employability and entrepreneurship.

A recent study involving 18,000 participants in 15 countries revealed that entrepreneurship is a future citizen skill (McKinsey & Company 2021). Higher education institutions are expected to nurture students into graduates who are capable of coping in an uncertain world as the responsibility in human capital (Barnett 2018). The catastrophic effects of the COVID-19 pandemic created a unique opportunity for entrepreneurship education along with challenges to higher education institutions (Liguori & Winkler 2020). The pandemic demonstrated the need for higher education institutions to develop students with E&I capabilities, now more than ever, that will enable them to strive in an uncertain world with disruptions in economic and social environments.

HEEEs have the ability to develop the ‘means’ of students, which Sarasvathy (2022) recognised as ‘Who I am’ (identity), ‘What I know’ (knowledge) and ‘Whom I know’ (network) and that lead decisions and actions that potential entrepreneurs are involved in. Although HEEE literature has not made explicit reference to effectuation theory, existing studies demonstrate that scholars have explored students more about what they know (Longva 2021; Webber, Kitagawa & Plumridge 2020; Guerrero, Urbano & Gajón 2020; Meyer et al. 2017; Wright, Siegel & Mustar 2017; Miller & Acs 2017). In this study, it is clear that HEEEs should provide the very input for the entrepreneurial process. HEEEs can not only deliver entrepreneurship education and support new venture creations (Rice, Feters & Greene 2014), but HEEEs should nurture ‘talent’ in the form of potential innovators and entrepreneurs with relevant E&I capabilities for the entrepreneurial ecosystem to harness.

Within less than a decade to achieve the United Nation SDGs (UNICEF 2022), higher education institutions must acknowledge their role in contributing to sustainable development through ‘quality education’ in their economy. In contrast, a majority of HEEE studies emphasise the role of higher education institutions in contributing to either economic growth or economic growth and social transformation. For instance, economic growth in Norway (Longva 2021) and the US (Miller & Acs 2017), and economic growth and social transformation in the UK (Webber, Kitagawa & Plumridge 2020). There is relatively little HEEE research that has focused on SDG4 and quality education, which aims to substantially increase the number of youths with relevant skills for entrepreneurship. In resource-constrained environments, like Sri Lanka, higher education institutions and their HEEEs hold stronger responsibility for aligning their entrepreneurial initiatives including HEEEs along with their national priorities and global movements.

Based on a research call by Webber, Kitagawa and Plumridge (2020), this study took a holistic approach of exploring HEEEs in their broader environment, being consistent with the interconnected nature of ecosystems. Prior studies have explored HEEEs and their composition by considering them as a standalone ecosystem (Lahikainen et al. 2019) and as a result isolating these ecosystems of higher education institutions from the bigger picture to some extent. A recent literature review on entrepreneurial ecosystems suggested that research should examine the complex system nature of ecosystems (Wurth, Stam & Spigel 2021). This study is consistent with this thinking and extends the co-creation of HEEEs by positioning them as a sub-ecosystem of entrepreneurial ecosystems and promoting their system nature. HEEEs can function more effectively when open to their wider entrepreneurial ecosystems and

collaborating with ecosystem actors. This study differs by showing that HEEEs depend on their respective entrepreneurial ecosystem and vice versa for effective functioning, particularly in a resource-constrained environment.

When operating together as one system, the entrepreneurial ecosystem can support HEEEs to adapt to new conditions and changes as entrepreneurship is dynamic and promotes resourcefulness. Further, where there are scarce resources, HEEEs can draw resources in the form of personnel, funding, infrastructure and services in support. The connection with the entrepreneurial ecosystem makes the HEEE sustainable (Theodoraki, Messeghem & Rice 2018) and allows both ecosystems to contribute to one another. Higher education institutions need to take a more integrated approach to co-creating their HEEEs by understanding the connection needed with their wider entrepreneurial ecosystem and that HEEEs are stronger together with their entrepreneurial ecosystem.

Findings reveal that HEEEs in the private sector hold minimal linkages with ecosystem actors from the wider entrepreneurial ecosystem, which are mostly one-time or ad hoc. These higher education institutions can learn from public universities that have co-created their HEEEs with stronger relationships with the entrepreneurial ecosystem. One example is the University Business Linkage by the University of Colombo, an effort to guide students to establish new ventures including start-ups with the support of collaborations and partnerships with industry and beyond (University of Colombo 2016). Another instance is the Center for Entrepreneurship and Innovation powered by the University of Sri Jayewardenapura with the purpose of promoting the E&I of the nation together with the broader community (University of Sri Jayewardenapura 2021). The Center for Entrepreneurship and Innovation actively operates with ecosystem actors to offer students entrepreneurship education and entrepreneurial support including training, information, incubation, access to networks and more (University of Sri Jayewardenapura 2021). Initiatives such as the University Business Linkage and the Center for Entrepreneurship and Innovation demonstrate formalised and stable relationships between public universities and the wider entrepreneurial ecosystem working together towards E&I among students. Private higher education institutions can mirror such initiatives for their HEEEs and make bonds with key ecosystem actors in a more regular and formal way.

Further, HEEEs should move beyond engaging students within the HEEE and expose them to the entrepreneurial ecosystem. Exposing students to the real world of E&I will help them grow and adapt. Involving the wider entrepreneurial ecosystem and engaging students with diverse ecosystem actors at different levels such as industries, governments and societies enables the development of E&I capabilities (Carayannis & Campbell 2009). The close interaction between students and ecosystem actors creates a favourable learning environment that enables students to recognise problems, identify opportunities and generate ideas through deeper knowledge and experiences while easing the challenges they face in resource-constrained environments. Further, students can draw inspiration, motivation, practical knowledge and even behaviours from ecosystem actors that they may lack within the HEEE in developing E&I capabilities. Such exploration and involvement will prepare students and potential entrepreneurs to smoothly enter the wider entrepreneurial ecosystem with some knowledge and networks.

Higher education institutions in more resource-constrained environments tend to pay less attention to external influences when co-creating their HEEEs and place greater emphasis on the internal environment, particularly strategies priorities. This study establishes the importance of HEEEs being open to the broader environment to embrace external influences as opposed to being insular and having boundaries. Such awareness and understanding of external influences would bridge the disengagement between HEEEs and the wider entrepreneurial ecosystem when addressing the needs of key stakeholders such as parents who have long term influence on their children (Gallage, Laferriere & Selvarajah 2022). Entrepreneurship literature asserts that parental influence is the most important factor that influences a child's development and choice of career, and entrepreneurial parents increase the likelihood of children starting an entrepreneurial career (Lindquist et al. 2015). Particularly in a resource-constrained environment, higher education institutions need to sense external influences, take targeted actions within their HEEEs and effectively use their resources to satisfy key stakeholders.

As a sub-ecosystem of the wider entrepreneurial ecosystem in which it is embedded, HEEEs should meet the social and economic needs of the ecosystem actors involved. It is important for higher education institutions to acknowledge and pay attention to other needs of academics, alumni entrepreneurs, parents and other ecosystem actors. Academics should be offered support by educating them and offering them avenues for development, as some lack experience in entrepreneurship and may not hold entrepreneurship-specialised education.

Extending from the view that HEEEs are sub-ecosystems of respective entrepreneurial ecosystems, this study demonstrates the interdependency between HEEEs and entrepreneurial ecosystems for E&I, and thereby contributes to the HEEE literature on the role that these ecosystems play in developing students' E&I capabilities. Higher education institutions represent a key domain of the entrepreneurial ecosystem that conducts teaching, research and entrepreneurship towards economic and social development (Isenberg 2010; Kirby, Guerrero & Urbano 2011; Guerrero, Urbano & Cunningham 2014). HEEEs are natural incubators for potential entrepreneurs are a significant input for the entrepreneurial ecosystem. These institutions and their HEEEs must understand their role extend beyond preparing students for E&I, and includes entrepreneurial mindset and intention, such as in recent HEEE studies including Webber, Kitagawa and Plumridge (2020), Guerrero et al. (2020) and Secundo et al. (2020).

The role of higher education institutions has been focused on teaching and research. Higher education institutions and their HEEEs are dealing with various challenges limiting the development into a fully-fledged ecosystem. To strengthen as an entrepreneurial institution and evolve their HEEE, different roles can be played serving the purpose to students and ecosystem actors. These roles extended the third mission of contribution to the society, involving influential, developmental, networking; entrepreneurial; and regional. By label, these roles sound typical however the contribution can be found in the uniqueness related to the resource-constrained context encompassed in these roles.

As higher education institutions in resource-constrained environment are principally focused on nurturing corporate-fit graduates, influencing students for entrepreneurship while developing their E&I capabilities is the much-needed transformation. Next, the role of networking was suggested for not only sharing resources but for social learning and community belonging that benefit students. To evolve as a HEEE, higher education institutions must assist their students to create start-ups through entrepreneurial support including access to incubators and accelerator programs. Fundamental to these roles are HEEEs being open to their regional milieu and national priorities and accepting the responsibility of leading human capital development. In this case, it is students with E&I capabilities who have the knowledge and skills related to the startup process, judgmental abilities associated with entrepreneurial action and social attitudes for networking (Alsos et al. 2022).

Higher education institutions and their HEEEs suffer from challenges that stem from the resource-constrained environment. The scarcity of resources for these HEEEs include two main scarcities: financial resources and human resources. By addressing these scarcities, HEEEs can effectively function developing students E&I capabilities. If higher education institutions orchestrate HEEEs by playing these five roles, they can combine existing and new resources to develop students' E&I capabilities. Creating this resource-rich environment is a key endeavor for higher education institutions and should engage with the wider entrepreneurial ecosystems that facilitates the five roles.

10.2.2 Beyond the common HEEE factors

The first part of the second research question investigated what diverse stakeholders perceive as the contextual factors of HEEEs that could influence students' E&I capabilities in a resource-constrained environment and three overarching findings surfaced. These findings contribute to illustrating the relationship between HEEEs and students' E&I capabilities in a resource-constrained environment. This study offers context-specific qualitative research concerning HEEE factors of higher education institutions in Sri Lanka, extending from the results of empirical studies in developed economies. The emergence of HEEEs in resource-constrained environments is highlighted in a literature-based study by Bedő, Erdős and Pittaway (2020) that suggested a conceptual framework towards student start-ups using Stam's (2015) entrepreneurial model. With little empirical evidence on HEEEs in a resource-constrained environment, this study is a study to explore the composition of HEEEs for developing students' E&I capabilities in developed countries.

Finding 4: Six contextual factors – entrepreneurial orientation, E&I education, E&I research, enterprising experiences, entrepreneurial networks and entrepreneurial support – can influence students' E&I in a resource-constrained environment (see 7.3).

Finding 5: Contextual factors are different to those commonly accepted in developed economies and are specific to institutional nature and geographic context (see 7.3 and 7.4).

Finding 6: Students involved in activities of HEEEs as a learning environment translates into students' E&I capabilities (see 7.5).

Despite how the co-creation of HEEEs begins, internal and external forces facilitate their development process (Rice, Feters & Greene 2014). The lack of existing HEEE studies involving the combined efforts of internal and external factors led this study to explore a more

holistic HEEE that took into account factors within the institution and outside in the broader environment. One study by Webber, Kitagawa and Plumridge (2020) explored entrepreneurship education, extracurricular activities and enterprise experiences while another study by Guerrero, Urbano and Gajón (2020) focused on educational programs, business incubators and other infrastructures. A recent study investigated a combination of internal and external factors extending curricular activities, co-curricular activities, enterprise experience, infrastructure, industry, incubators and public support systems (Longva 2021). The findings from this study illustrates a set of six contextual factors along with 18 operational mechanisms that may have a positive influence on developing students' E&I capabilities enabling higher education institutions in resource-constrained environments to operate their HEEEs more effectively. Existing HEEE studies have not explicitly identified the six contextual factors found in this study, although some similarities such as entrepreneurship education exist (Longva 2021; Meyer et al. 2020; Webber, Kitagawa & Plumridge 2020; Wright, Siegel & Mustar 2017; Miller & Acs 2017; Rice, Feters & Greene 2014). The commonly identified 'entrepreneurship education' factor among current HEEE studies is enhanced as 'entrepreneurship and innovation education' in this study, acknowledging the difference that innovation makes in entrepreneurship. Business models and product ideas can be new and good but this is not the same as innovative ideas that have something more. Such businesses and products with that 'wow' factor have the difference of 'innovation'. Education in E&I would ensure that students learn how to use innovative techniques to create value in a start-up while developing E&I capabilities.

Entrepreneurship education and entrepreneurial support are both a substantial opportunity for higher education institutions and a significant responsibility. While student start-ups are most prominent among HEEEs in developed economies in resource rich environments (Longva 2021; Meyer et al. 2017; Wright, Siegel & Mustar 2017; Miller & Acs 2017; Rice, Feters & Greene 2014), HEEEs in resource-constrained environments need to work actively in developing students' E&I capabilities. The challenge is how these higher education institutions identify the contextual factors within their HEEE composition to drive E&I (Cunningham, Lehmann & Menter 2021). An early study found that relative strengths of HEEE factors may vary, however all higher education institutions share common factors (Rice, Feters & Greene 2014). Through this study it became evident that HEEE factors vary in effectiveness according to the resource-constrained environment. While some factors may be similar in HEEEs in developed and developing countries, there are other HEEE factors that are

unique to the institution and the context. There is uniqueness among HEEE factors because of the nature of the institution and circumstances of the context. In an emerging economy, most higher education institutions in Sri Lanka do offer an entrepreneurship program or have resources for a separate entrepreneurship department/division or chair or offer access to start-up funding, links to angel investors or incubators for students. This understanding from this study contributes to the clarification of HEEE factors as highlighted by Hsieh and Kelley (2020) and the emerging knowledge body of HEEEs in resource-constrained environments explored by Bedó, Erdős and Pittaway (2020).

Higher education institutions and their HEEEs in resource-constrained environments depend on support from individuals and organisations in the entrepreneurial ecosystem to operationalise some HEEE factors. In this case, institutions should shift from traditional ways of working, limited to the institution, into more inter-institutional and collaborative partnerships to build sustainable HEEEs. In developed economies, there is evidence of how some HEEEs collaborate with various ecosystem actors including alumni entrepreneurs and industry for better access to resources and services (Fetters, Greene & Rice 2010; Hancock 2011). Similarly, the University of Peradeniya (2021) has liaised with the British Council to promote social entrepreneurship among all students and support potential social entrepreneurs.

Further, some of the top public universities including the University of Colombo, University of Peradeniya, University of Sri Jayewardenepura, University of Kelaniya, University of Moratuwa and University of Ruhuna were found to be collaborating to some extent with one another in contribution to the National Innovation System (Weerasinghe, Jayewardene & Deshani 2016). By contrast, existing HEEE studies have not found higher education institutions working with similar institutions in joint efforts. Developing countries confront the challenges of their resource-constrained environment in their own ways, differently to developed economies. HEEEs in resource-constrained environments can develop stronger collaboration with other higher education institutions to improving the ability to overcome challenges and share resources for functioning effectively. In this respect, this study brings an understanding of how HEEE factors can work differently in some environments and not others. This study calls for a closer integration of an HEEE in the respective entrepreneurial ecosystem to work with more stakeholders including other higher education institutions. Therefore, having boundaries or not sharing resources restricts the success and survival of HEEEs. In this sense, HEEEs as an ‘open-system’ orchestration would work better in resource-constrained environments, as opposed to the common closed system.

Entrepreneurship literature has established the system nature of ecosystems (Stam 2015; Feld 2012; Isenberg 2011; Cohen 2006; Neck et al. 2004). According to the open system developed by Ludwig von Bertalanffy (1956), parts are independent and the interactions between parts become more complex. This means that each factor within the HEEE needs to function collaboratively with the other factors; there might not be a direct impact or interdependence, but everything is connected to the value proposition. A student may devote psychological and physical energy to studying, taking part in activities, attending events and interacting with peers, academics and other ecosystem actors during their higher education journey. What this student learnt in the classroom (E&I education) may be applied during an internship with a start-up or while participating in an entrepreneurship-related competition (enterprise experiences). While interacting at an event (entrepreneurial networks), the student may have been inspired about a related topic or issue that they discuss with their expert mentor (entrepreneurial support) for better clarity. Through the HEEE, students will have access to various activities and may participate continuously during their journey; participation in one activity may have an impact in another, translating to their capability development.

Entrepreneurial ecosystems are formed by various domains or organisations working together and creating value for the economy and society. HEEEs are largely known to support entrepreneurship development through a variety of related activities in the context of a specific higher education institution (Fetters, Greene & Rice 2010; Belitski 2019). In this study, the HEEE is viewed as the 'learning environment' that affects the evolution of students, which can also be understood as students' entrepreneurial development. In this sense, students adapt to the environment; embrace new dynamics; build relationships; and develop their mindset, intention and capabilities with the support of the HEEEs and their ecosystem actors. Thus, it is important to understand the co-evolution between students, the higher education institution and ecosystem actors. This means the influence of growth and evolution of each other through shared relationships. On the one hand, students develop their E&I capabilities through close interactions with the higher education institution and ecosystem actors. On the other hand, higher education institutions can co-create and evolve their HEEEs through reciprocal relationships between students and ecosystem actors. Findings point out that evolution between students, the higher education institution and ecosystem actors is a result of working together within the HEEE. In addition to sharing the evolution of each other, there is also the transition from one ecosystem to another. Initially, students are part of the HEEE as their learning

environment and then they may progress as graduates to become entrepreneurs or intrapreneurs in the wider entrepreneurial ecosystem.

Diverse stakeholders perceived six contextual factors of HEEEs that could influence students' E&I capabilities in a resource-constrained environment: entrepreneurial orientation, E&I education, E&I research, enterprising experiences, entrepreneurial networks and entrepreneurial support. These contextual factors are similar but different contextual factors are specific to institutional nature and geographic context as the composition of HEEEs. Students involved in various activities of HEEEs as a learning environment translates into their capability development. When illustrating the relationship between HEEEs and students' E&I capabilities in a resource-constrained environment, contextual factors go beyond the commonly accepted factors.

10.2.3 Beyond factors of higher education entrepreneurial ecosystems

The final part of the second research question explored how specific contextual factors of HEEEs could influence students' E&I capabilities in a resource-constrained environment. From this exploration, three key findings emerged. Existing research has presented exclusive lists of factors that represent the composition of HEEEs for respective higher education institutions in developed economies. As suggested by Longva (2021), future studies need to go beyond identifying HEEE factors, and this study takes a step further by offering insights on the 'how' aspect, demonstrating ways in which such contextual factors can be implemented within the HEEE from the perspective of key internal and external stakeholders. With little research on how higher education institutions can operationalise HEEE factors, this study extends the literature by adding knowledge on mechanisms and extending the approach to be taken when configuring HEEEs.

Finding 7: Mechanisms that emerged in this study are practical solutions addressing problems in implementing contextual factors of HEEEs in a resource-constrained environment.

Finding 8: The approach to operationalising contextual factors needs to put 'people' at the centre of the process empathising the needs of ecosystem actors.

Finding 9: Higher education institutions do not see the whole-picture perspective of their HEEE as a value chain.

Some efforts have started to emerge on how a higher education institution and its HEEE can operationalise towards achieving desired outcomes, either student start-ups, entrepreneurial mindsets or intentions. One such conceptual study suggested overarching ways such as knowledge creation and spill over; human capital creation and acquisition; social capital connectivity; funding intermediation; economic diversity and fluidity; enabling infrastructure; incubation and catalytic change; and cultural change for operationalising an HEEE towards student start-ups (Bedó, Erdős & Pittaway 2020). While these emerging mechanisms are institution focused and broad, this empirical study explored specific mechanisms that may work within each contextual factor, addressing any challenges in a resource-constrained environment.

When examining the influence of entrepreneurial ecosystems on the entrepreneurial process, it was found that the context, in this case the HEEE, can be a driver as well as a barrier (Guerrero et al. 2020). Higher education institutions in developing countries may have hindering factors that differ or do not exist for HEEEs in developed economies. These challenges are context based and could be the opposite among higher education institutions in developed economies. While management drive, institutional strategies and focus on preparing future entrepreneurs were facilitating attributes of a Finnish higher education institution (Lahikainen et al. 2019) and the National University of Singapore (Po, Singh & Wong 2010), these tend to be more hindering factors of a typical higher education institution in Sri Lanka. Findings reveal that higher education institutions face a lack of institutional direction where institutional priorities do not align with national priorities such as entrepreneurship education and future youth with entrepreneurial capabilities. Extending from this, most higher education institutions have weak relationships with the entrepreneurial ecosystem, which results in failing to understand the role it plays in the shared value proposition. Next, few higher education institutions have strategic objectives oriented towards being entrepreneurial; however, the operations taking place do not work in their favour. These institutions tend to limit resources for operationalising entrepreneurial initiatives of HEEEs and, for instance, this leads to poor entrepreneurial exposure for students. Also, the dyadic relationships between higher education institutions and multinational companies restrict the institutions from understanding the potential of start-ups in benefiting their HEEEs, building networks and collaborating to build students' E&I capabilities. Last, higher education institutions make the criticism that only a small number of students are keen on an entrepreneurship major, and it seems that there almost no attention on the view of commercialising through HEEEs.

Previous studies demonstrate HEEEs as an entrepreneurial initiative well supported by the senior management of higher education institutions and pay less attention to examining contextual factors of senior leadership. One of the early studies proposed senior leadership vision, engagement and sponsorship as key success factors, having found that the senior leadership commitment sustains the HEEE as a robust ecosystem (Rice, Fetters & Greene 2014). When taking on the third mission of teaching, research and entrepreneurship, the leadership team of the National University of Singapore committed to a vision of ‘global knowledge enterprise’ and reoriented the core function of education in preparing students through an emerging HEEE to improve entrepreneurship education and stimulate student start-ups (Ho, Singh & Wong 2010).

Contrasting to existing HEEE studies based on developed economies, empirical findings reveal the lack of commitment and enthusiasm from senior management towards their HEEEs. Higher education institutions in the Sri Lankan private sector do not seem to be convinced by entrepreneurship just yet, according to their current programs, initiatives and actions. Although there is an increasing wave of entrepreneurship among public universities and in the broader society, where even media companies are promoting entrepreneurial reality shows such as “Startup 2021” (TV Derana 2022), senior management of private institutions are found to pay less priority to entrepreneurship education and investing in entrepreneurial initiatives such as HEEEs. Senior management seems to fail to understand the changing career preference towards entrepreneurship held by students, the preference of entrepreneur parents as well as the importance of enhancing entrepreneurial capabilities in students to support their future, long-term career potential, and they overlook students who may want to work in the start-up industry. It appears that higher education institutions are not strongly committed to their HEEEs due to the lack of understanding held about the dynamics in their broader environment. Senior leadership was suggested as a key success factor for HEEEs in early literature (Rice, Fetters & Greene 2014) and in this study, senior leadership is framed as a way to operationalise (i.e. a mechanism) the contextual factor of ‘entrepreneurial orientation’. Unlike HEEE studies in developed economies, this study demonstrates the importance of the internal drive from senior management as a mechanism in co-creating HEEEs for higher education institutions in a resource-constrained environment.

The argument on whether entrepreneurship can be taught is becoming obsolete given the increasing number of entrepreneurship degrees, specialisations and courses along with the success of entrepreneurial graduates and growing demand for entrepreneurship educators

around the world (Hagg & Kurczewska 2021). Entrepreneurship education is very much in vogue across developed economies where many higher education institutions offer courses and classes in entrepreneurship to the broader student population. Almost every HEEE study in the literature found programs in entrepreneurship or entrepreneurship and innovation offered for undergraduates (Fetters, Greene & Rice 2010; Miller & Acs 2017; Meyer et al. 2020; Guerrero, Urbano & Gajón 2020; Webber, Kitigawa & Plumridge 2020; Longva 2021). Some public universities in Sri Lanka, such as the University of Sri Jayewardenepura (2021) which offers a Bachelor of Science in Entrepreneurship, are unlike private higher education institutions in Sri Lanka that fall short in offering entrepreneurship education programs and influencing students' entrepreneurial careers. Similar to Hartmann (2021), these higher education institutions perceive that there are more pains than gains associated with offering entrepreneurship education, especially related to costs. With this perspective, students are exposed in the direction of stable careers as employees, limiting the development of E&I capabilities which are applicable to a corporate career, self-employment and personal identity development in multiple walks of life. Given that E&I education is a key factor of HEEEs, students should have access to entrepreneurship courses and classes that may influence some of them towards an entrepreneurial career and others to work in start-ups.

Incubators (Longva 2021; Webber, Kitagawa & Plumridge 2020; Guerrero, Urbano & Gajón 2020; Meyer et al. 2017; Wright, Siegel & Mustar 2017) and accelerators (Wright, Siegel & Mustar 2017; Miller & Acs 2017) are common factors for entrepreneurial support in building the composition of HEEEs. HEEEs in developed economies such as the US offer entrepreneurial support to students through start-up funds, in-house incubators and accelerator programs (Rice, Fetters & Greene 2014). Findings from this study highlighted that internal stakeholders see no pathway for the creation of incubators and accelerators in private sector HEEEs, whereas external stakeholders believed that entrepreneurial support through incubators and accelerators is essential but was limited. Particularly in Sri Lanka, financing incubators and accelerators is costly for higher education institutions in the private sector and as a result this limits the entrepreneurial support available for students. In a resource-constrained environment, these factors need to be achieved differently from how they are implemented by higher education institutions in a developed economy.

Mechanisms for providing the benefits from incubators and accelerators appear possible through support and collaboration with ecosystem actors. Higher education institutions can collaborate with other private institutions or public universities to share

incubators or accelerators, leading to higher student participation. The Sri Lanka Institute of Information Technology, a leading private higher education institution is actively managing a technology-based incubator that provides a variety of resources and services such as business acumen, funds, access to networks and communication facilities (SLIIT 2020). The University of Peradeniya (2021) launched a Social Enterprise Incubation Laboratory to offer students mentoring, training and access to relevant agencies for a social entrepreneurship start-up. These are possibilities for students from higher education institutions to access such incubators of other private institutions or public universities. Furthermore, support from the public system can offer students access to facilities such as hosting incubator and accelerator programs for HEEEs, regional incubators or national accelerator programs. In contrast to owning, managing and running such facilities and programs in more developed economies, higher education institutions in resource-constrained environments can operationally address challenges by sharing infrastructure, resources and services available in the broader entrepreneurial ecosystem and environment. Findings in this study reveal that entrepreneurial support can take forms such as mentoring with experts, and access to shared incubators and private accelerator programs in resource-constrained environments.

Entrepreneurship, including start-ups, are recognised as a driver for economic growth and social transformation (Audretsch et al. 2021; Webber, Kitagawa & Plumridge 2020; Klofsten et al. 2019). Given that entrepreneurship is considered a societal phenomenon (Davidsson 2003), looking beyond unicorns (ventures valued at USD1 billion), decacorns (ventures valued at USD10 billion) and foreign direct investments as benefits at the national level, a meaningful purpose of entrepreneurship in an emerging economy is financial independence. The Sri Lanka Startup Report 2019 showed that financial motivation is the second top reason for embarking on a start-up (PricewaterhouseCoopers 2019). Financial independence can be achieved through entrepreneurship education (O'Connor 2013) in the case that youth create their own start-ups as assets that generate income to pay for living expenses without depending on a job or others and equity that can grow wealth. This means that HEEEs can respond to economic and social needs by developing students' E&I capabilities and as a result contributing towards financial independence of youth in an emerging economy. In a resource-constrained environment, developing students with E&I capabilities can support youth to progress beyond living paycheck to paycheck and improve their financial independence, through which they can improve their quality of life.

Entrepreneurship involves entrepreneurial individuals forming or transforming organisations that create value including financial or social benefits (Gartner 1990). Value is understood as a promise of tangible and intangible benefits that a business offers for its customers (Lanning & Michaels 1988). For higher education institutions, a core value proposition is to offer quality higher education for students that likely has long-term sustainability and impact (O'Brien, Cooney & Blenker 2019). Higher education institutions becoming entrepreneurial creates and maximises value through HEEEs. Ecosystems such as HEEEs must create a differentiated value proposition to attract students, the end consumer (Adner, Oxley & Silverman 2013). To do so, higher education institutions may want to support students beyond educating them to secure a corporate job, such as developing students with E&I capabilities to become entrepreneurs and move up the economic ladder, unlocking their financial independence, in a resource-constrained environment. A higher education institution vision and value proposition must express that the institution deeply cares about students' career aspirations and their development for the future. They must improve the current promise of the ability to secure a stable job with a competitive salary through a first degree to include the career option of self-employment, founding start-ups and becoming entrepreneurs. Selling a value proposition of such nature and promoting the betterment of students will help in co-creating a sustainable HEEE in a resource-constrained environment. This new thinking brings an integral element of value proposition from strategy and marketing (Lanning & Michaels 1988) to HEEE literature.

Aligning to such a more holistic value proposition would require higher education institutions to take on a dichotomous role by catering for students who prefer a corporate career and others who desire an entrepreneurial career. This means providing high quality learning experiences for their students and contributing towards the United Nations SDG4 of quality education (United Nations 2020). In a resource-constrained environment, many higher education institutions may not see the benefit of entrepreneurship and tend to avoid wider efforts to focus on students' alternative career aspirations. Higher education institutions must begin to believe that to create value, their institutions must be strategically entrepreneurial (Covin 2002) and holistic, better understanding the value chain they are a part of. In this case, higher education institutions need to understand the diverse ecosystem actors, from potential students and parents to current students, alumni, industries, start-ups and the wider ecosystem in which the HEEE operates. This understanding of the value chain emphasises the role higher

education institutions and their HEEEs play in developing youth with relevant skills including in E&I for entrepreneurship and employment.

Ecosystems include a set of actors that need to be brought together in alignment for a value proposition to materialise in the environment (Adner 2017). Similarly, in HEEEs, senior management of institutions must bring ecosystem actors together and embrace the same ethos in developing students for E&I. Externally, ecosystem actors from diverse backgrounds with individual goals can work together and amplify their contributions to the value proposition that the HEEE is working towards. Internally, senior management can train their employees to think and work in teams towards the value proposition. In co-creating and evolving HEEEs, higher education institutions must understand the holistic transformation and management involved. Entrepreneurship and innovation should be a way of being, behaving and interacting among each other within the HEEE and in the wider entrepreneurial ecosystem.

Internal stakeholders shared their challenges and external stakeholders offered insights on the ways in which the six contextual factors can be implemented within HEEEs. Mechanisms of operationalising contextual factors can be practical solutions addressing problems prevailing in a resource-constrained environment. Further, the approach to operationalising contextual factors needs to put ‘people’ at the centre of the process, with empathy to understand the needs of diverse ecosystem actors. When co-creating and evolving HEEEs, higher education institutions can view this as holistically seeing the whole-picture perspective in any value chain. Findings from this study add understanding and knowledge to the literature, beyond the composition of factors to the configuration of HEEEs.

10.2.4 Beyond the composition of HEEEs

The third and final research question studied how diverse stakeholders can engage within the factors of HEEEs that could influence developing students’ E&I capabilities in a resource-constrained environment. Three overarching findings emerged illustrating ways ecosystem actors and social capital influence the development of students’ E&I capabilities within HEEEs in a resource-constrained environment through stakeholder engagement. Developed capabilities are referred to as resources, particularly related to social capital (de Brito, Lenz & Pacheco 2022).

Finding 10: Higher education institutions and their HEEEs lack the social network of internal and external stakeholders within the contextual factors (see 9.3).

Finding 11: Developing social capital enables HEEEs to function effectively through people, knowledge and relationships (see 9.4 to 9.9).

Finding 12: Ecosystem actors embedded within the contextual factors of HEEE create, share and capture value towards a shared value proposition (see 9.10).

HEEEs are primarily defined by the ecosystem actors within a specific context that may contribute to the function of delivering entrepreneurship education and supporting start-ups (Fetters, Greene & Rice 2010; Rice, Fetters & Greene 2014; Bock et al. 2020). HEEE studies investigate factors relevant to geographic contexts although they are not explicitly included in the definitions of the concept (Miller & Acs 2017; Rice, Fetters & Greene 2014). This study reveals the pivotal role that ecosystem actors, such as alumni entrepreneurs, play in orchestrating the HEEE factors with a collective effort in a resource-constrained context towards developing students for E&I. Social networks facilitate exchange between stakeholders and in this case, it is the exchange of resources. This advances the understanding the definition of HEEEs as a combination of factors and actors, similar to the definition of entrepreneurial ecosystems by Stam and Spigel (2016).

When examining the existing HEEE definitions, it is evident that scholars have highlighted ecosystem actors such as ‘multidimensional enterprises’ (Fetters, Greene & Rice 2010) to ‘a set of actors’ (Bock et al. 2020) within a specific context that may contribute to delivering entrepreneurship education and supporting start-ups. However, the extant HEEE literature explores factors as the composition of HEEEs with less attention to the ecosystem actors identified in the definitions of the concept. The corollary of the insight, the African proverb “It takes a village to raise a child”, applies here; in the sense that it takes a community of individuals and organisations to develop an entrepreneur and their start-up in a conducive environment (Lyons 2002). Further, as John Donne, the English poet wrote, “no man is an island, entire of itself” (Doanward & Rasciute 2016); in this case, a potential entrepreneur who is disconnected from others and isolated from the environment cannot thrive on their own. To fully understand HEEEs, it is essential to recognise and appreciate their network and the network in which it is embedded. Broadly, no HEEE or potential entrepreneur is self-sufficient. In order to develop students’ E&I capabilities, HEEEs need to collaborate over the identified six contextual factors with ecosystem actors, who can contribute to the value proposition. Advancing the understanding of the HEEE composition established by existing studies, this study encompassed factors with relevant actors.

Most top 12 reasons start-ups fail point at the entrepreneur rather than the market, competition and investors, and founders are held responsible (CB Insights 2021). Sri Lanka as an emerging economy suffers from a high start-up failure rate and the top associated reasons are insufficient business acumen, lack of market research and lack of commitment of entrepreneurs (PricewaterhouseCoopers 2020). Social networks are a mechanism for facilitating entrepreneurship (Hills et al 1997; Singh et al 1999) and engaging with the environment (Johannisson 1988; Weick 1969). A variety of stakeholders shape the development of E&I capabilities obtained by students (Spigel 2017).

Socially proximal groups in the HEEE and the entrepreneurial ecosystem can develop students for E&I, and potentially increase the number of successful start-ups by improving their E&I capabilities. Not only can students gain access to infrastructure and resources through their networks, students also learn better and develop stronger commitment through the inclusion of relevant stakeholders from the entrepreneurial ecosystem. Through social learning from relevant ecosystem actors, students can learn various knowledge and skills of business acumen and develop the core market research skills needed as E&I capabilities to build a successful start-up. The capability of learning contributes to the potential long-term survival of small businesses, including start-ups (de Brito, Lenz & Pacheco 2022). For this capability development to happen, HEEEs can embed relevant ecosystem actors within the contextual factors to promote social learning.

Higher education institutions have low connectedness where they lack institutional frameworks and support mechanisms in promoting social interactions among their students (de Silva, Uyerra & Oakey 2012). These higher education institutions tend to operate within closed environments to a large extent and any external relationships are more of an ad hoc nature. Within the HEEE, this means that they lack the strengths that local relationships and a sense of community for the ecosystem. This low connectedness hinders the ability of social learning for students where they can acquire new knowledge and behaviours by observing others, such as young entrepreneurs and expert mentors. Social interactions with relevant external stakeholders will offer students exposure beyond the classroom and books. In contrast to some higher education institutions in the private sector, public universities such as the Department of Entrepreneurship of the University of Sri Jayewardenepura (2021) have strong ties with entrepreneurs and regularly invite them to share inspirations, motivations, knowledge and experience with students and staff via an online forum. This is consistent with the Innovation and Entrepreneurship Development Unit of the University of Colombo (2021) that has active

dialogue with entrepreneurs to create awareness and share knowledge on starting and doing small businesses. Given the collective culture in Sri Lanka (Hofstede Insights 2022), relationship building should come naturally, with a high degree of interdependence in the community. Social interactions with diverse stakeholders have been found to play a critical role in the cognitive development of students (Okita 2012). In this case, HEEEs offering opportunities for social interactions and learning can develop students' E&I capabilities through support and long-term commitment from a collectivist society where people perceive that they belong in groups and have strong relationships.

Building relationships and engaging with ecosystem actors results in social capital that is greatly associated with successful venture outcomes. Exposing students to entrepreneurial ecosystems and offering opportunities to engage with relevant stakeholders can benefit their resource repertoire. External stakeholders claim that it is necessary for students who are potential entrepreneurs to build their social capital in the early stages, particular in a resource-constrained environment. Students build their social capital within HEEEs during their higher education journey (Longva 2021). While higher education institutions and their HEEEs build people (structural), knowledge (cognitive) and relationships (relational) through social capital, students can benefit from whom they have met and get to know. To start as an entrepreneur and pursue entrepreneurship, students tend to convince themselves of a common future with successful entrepreneurs they know (Wiltbank et al. 2006) and turn to who they know in the network (Sarasvathy & Dew 2005). In this case, social capital may develop students' self-efficacy and E&I capabilities with HEEEs playing an important role in entrepreneurial careers, both in the short term and long term as students' progress in their careers.

In developing countries, HEEEs operate with resources drawn from the respective higher education institution and from external sources. To function effectively, HEEEs in resource-constrained environments need to develop their resource repertoire, in addition to the resources of students. Instead of calling for resources in general for the HEEE, each HEEE factor can benefit from the engagement of both internal and external stakeholders. Ecosystem actors can be embedded within the six identified contextual factors, creating, sharing and capturing value. However, this study found signs of social barriers between higher education institutions and ecosystem actors that create costs and losses, depleting energy in working together within the HEEE. In moving forward, attracting relevant ecosystem actors and leveraging stakeholder engagement within the HEEE can bridge social barriers and foster connectedness. Being embedded within the entrepreneurial ecosystem, including a sense of

community and local relationships between ecosystem actors, is strongly associated with start-up performance; high connectedness of the ecosystem results in higher start-up performance (Genome Global Startup Ecosystem Report 2018). Strengthening the connectedness of an HEEE may have a ripple effect and improve the low connectedness rating and the health of the entrepreneurial ecosystem in Sri Lanka (Genome Global Startup Ecosystem Report 2021). Higher education institutions can benefit from involving stakeholders who matter the most to the development of E&I capabilities in their respective HEEEs and connect with the wider entrepreneurial ecosystem. How and the degree to which HEEEs are connected to the entrepreneurial ecosystem can influence developing students' E&I capabilities and the performance of both ecosystems. In a resource-constrained environment, connecting ecosystems and embracing as a community can result in a competitive advantage.

Developing an entrepreneurial community can assist entrepreneurs in the creation, growth and survival of their start-ups (Koven & Lyons 2003). Even in the most entrepreneurial regions in Europe, some higher education institutions lack an entrepreneurial community to support their students and start-ups (Belitski 2019). In HEEE studies, entrepreneurial clubs and other societies in the form of networks can act as entrepreneurial communities (Wright, Siegel & Mustar 2017; Miller & Acs 2017). Relationships can be created not just within HEEEs but between HEEEs of different higher education institutions and even with the wider entrepreneurial ecosystem. HEEE communities are shaped by risk-taking management, courageous educators, supportive entrepreneurs, tenacious mentors and potential student entrepreneurs in these ecosystems. Contextual factors and ecosystem actors of HEEEs working together can lead to individual and societal impacts in a resource-constrained environment. When connecting and collaborating with stakeholders in the entrepreneurial ecosystem, this leads to developing an entrepreneurial community and improving the wellbeing of HEEEs. The more HEEEs are exposed to the unity of their contextual factors and ecosystem actors, the more this becomes inclusive and harmonious, going beyond the factors and strongly evolving into the wider entrepreneurial ecosystem.

Diverse stakeholders can engage within the factors of HEEEs that could influence students' E&I capabilities in a resource-constrained environment. To do so, higher education institutions need to embrace the social element of HEEEs and understand the network of internal and external stakeholders within the identified six contextual factors. Developing social capital enables HEEEs to function effectively through people, knowledge and relationships. When ecosystem actors embed the contextual factors of HEEEs, they create,

share and capture value towards a shared value proposition. These empirical findings illustrate the relationship between HEEEs and students' E&I capabilities in a resource-constrained environment, beyond the composition of HEEEs.

10.3 Contributions and implications

10.3.1 Contributions to theory

This study generates significant contributions to the HEEE literature and to the intersection of entrepreneurship and the entrepreneurial ecosystem. In reference to theoretical contributions by Locke and Biddle (1997), this study fills in some 'incompleteness' and 'inadequate' aspects in the existing body of HEEE knowledge. In some instances, the concept of HEEE is in its initial stage of development and extant literature is neither mature nor comprehensive. In other instances, HEEE literature has overlooked different views that are significant for a more nuanced understanding.

Previous literature indicates that HEEEs are not only emerging but also an underdeveloped theoretical stream (Longva 2020; Hsieh & Kelley 2020). The first contribution of this study is related to the outcome of HEEEs, particularly through the views of internal and external stakeholders. Despite the exponential growth of HEEE studies, most studies focus on students' start-ups and more recently students' entrepreneurial mindset and intention, paying less attention to the capabilities needed to bridge the two. In a context which the literature stream on HEEEs is primarily focused on student start-ups, this study emphasizes the relevance of developing E&I capabilities of students. HEEEs need to shift focus to developing E&I capabilities of students and reduce the widening gap between entrepreneurial mindset and intentions and student start-ups. This understanding brings E&I capabilities to HEEE literature advocating for human capital development of entrepreneurs in resource-constrained environments (de Brito, Lenz & Pacheco 2022; Mair et al. 2012). More precisely, developing E&I capabilities of students can help to improve start-up failure caused due to lack of entrepreneurial skills and expertise as found in a report by PricewaterhouseCoppers (2020). Further, HEEEs focusing on E&I capabilities will also help students across multiple occupation roles from self-employment and hybrid entrepreneurship to intrapreneurship (Alsos et al. 2022). This holistic view of HEEEs contributes to a more advanced understanding of the concept that embraces the systematic perspective of ecosystems.

The literature highlights a lack of knowledge about the concept of HEEEs and the need for the composition to be clarified (Hsieh & Kelley 2020). A common interest in the literature

is the key success factors that form the HEEE composition of a higher education institution in an emerging economy (Fetters, Greene & Rice 2010). Several studies have attempted to understand the HEEE factors that lead to students' start-ups, entrepreneurial mindset and intention. However, the literature overlooks understanding for those higher education institutions who may want to promote entrepreneurship in resource-constrained environments (Roundy 2017) and co-creating HEEEs in such environments is inherently challenging as they lack resources (Bedő, Erdős & Pittaway 2020). The HEEE composition including entrepreneurial orientation, E&I education, E&I research, enterprise experiences, entrepreneurial networks and entrepreneurial support emerged from this study as a set of six contextual factors that students may involve in and as a result develop their E&I capabilities. These contextual factors are unique to some extent to the nature of higher education institutions and are shaped by the specific challenges and circumstances of the developing country. As a result, the HEEE factors may differ according to the context and will not remain common across higher education institutions as found by Rice, Fetters and Greene (2014). Co-creating HEEEs in resource-constrained environments differ from developed countries confirming that context matters, consistent with Welter and Lasch (2008).

This study brings another theoretical contribution related to ecosystem actors. First, literature on HEEEs has mainly focused on composition by determining what factors work for respective higher education institutions, mostly case by case (Miller & Acs 2017; Rice, Fetters & Greene 2014) or in a region/country (Webber, Kitagawa & Plumridge 2020). Second, some studies recognise ecosystem actors such as industry and public systems that can add value to the HEEE (Longva 2021). Factors and actors are explored and examined more individually rather than how factors can involve actors or vice versa, while there is a need to address all parts (factors and actors) of the ecosystem (Volkman et al. 2021). Ecosystem actors shape the flow of entrepreneurial knowledge and skills obtained by students (Spigel 2017). Therefore, all stakeholders should be involved in HEEEs (Rice, Fetters & Greene 2014) whereas higher education institutions in resource-constrained environments lack networks and collaborations for various reasons (Bedő, Erdős & Pittaway 2020). In addition to limited resource allocations for entrepreneurship, higher education institutions in Sri Lanka also lack strong networking relationships with stakeholders (Weernasinge, Jayewardane & Deshani 2016). Similar to Barki et al. (2020), this study also establishes the importance of social capital in overcoming challenges and crafting ecosystems in more resource-constrained environments.

A final and important contribution is linked to the approach of designing HEEEs in resource-constrained environments. Previous studies have focused on co-creating HEEEs by exploring their composition, without reaching consensus on the approach of design. The literature lacks understanding of how a higher education institution's internal design serves the purposes of an HEEE (Brush 2014). Higher education institutions need to understand value creation through their HEEEs. While value creation tools are not as common in the education environment, various tools from other disciplines can be contextualised (Lackéus 2015). Illuminating the findings, this study brings a design approach to literature for designing HEEEs in order that they co-create, grow and scale while addressing challenges in a resource-constrained environment.

10.3.2 Implications for practice

From a practical point of view, the objective of these implications is to encourage higher education institutions to co-create and evolve their HEEEs, aligned with the wider entrepreneurship ecosystem, to build a sustainable HEEE. Given the study focused on a resource-constrained environment, Sri Lanka, most of the implications below relate specifically to higher education institutions in developing countries. In addition, there are some practical implications applicable for all HEEEs including in developed economies.

Industries around the world are facing a paradigm shift in organisation and taking on the ecosystem perspective to business models to achieve goals such as creating value, growing core businesses and generating revenue (McKinsey & Company 2021). Higher education is one such industry where some institutions are launching entrepreneurial initiatives such as HEEEs for business enhancement. Enhancing higher education institutions requires change and traditional institutions are increasingly being replaced with ecosystems where HEEEs comprising diverse stakeholders within and outside work together in shaping the E&I capabilities of the next generation.

The understanding advocated in the literature refers to the tip of the iceberg that involves delivering entrepreneurship education and supporting new ventures in HEEEs. What we pay less attention to is the bottom of the iceberg that involves designing the co-creation of the HEEE. Empirical findings pose important implications for higher education institutions on how to co-create an HEEE and design a learning environment to develop E&I capabilities of students. A key argument brought forward by Isenberg (2016) is that ecosystems are self-organising and self-sustaining and such ecosystems are affected, influenced and facilitated

rather than co-created. Despite this argument, almost all HEEE studies refer to co-creating or developing HEEEs. Going with most views, HEEEs are co-created and emerge, similar to any ecosystem. Based on the findings from the research questions, practical implications for higher education institutions in a resource-constrained environment, particularly Sri Lanka, are that they need to design an HEEE that suits the nature of the institution and the geographic context. Higher education institutions need to undertake a design approach and make key choices to increase the effectiveness of their HEEEs. These HEEE design choices must be consistent with respective entrepreneurial ecosystems and offer a coherent configuration.

Co-creating an HEEE as a learning environment requires higher education institutions to take responsibility as the orchestrator focused on developing students' E&I capabilities. As the orchestrator of their HEEE, higher education institutions need to uphold their responsibility to national priorities and take accountability at global level. Education is recognised as an integral element of the United Nations Sustainable Development Goals, particularly SDG4 'quality education', and a key enabler for all the other SDGs. Higher education institutions can champion sustainable development by supporting, promoting and contributing to high quality education. Although Sri Lanka claims that the nation is implementing the SDGs to improve sustainability (Ministry of Sustainable Development 2018), most higher education institutions are yet to align their services and operations to relevant targets, perhaps not realising that the education sector plays a pivotal role in global sustainability. Further, business schools of private higher education institutions in Sri Lanka are not listed as signatory members of the Principles for Responsible Management Education (PRME) Community of Practice (PRME 2022). In this case, these higher education institutions are less connected with the global movement of quality education through responsible management. Being involved in such communities would enable higher education institutions to understand the new shifts in higher education and be inspired by these principles. For instance, the first principle aims to "develop the capabilities of students to be future generators of sustainable value for business and society at large and to work for an inclusive and sustainable global economy" (PRME 2022). Embracing these principles in the business model will encourage higher education institutions to commit and play an influential role in quality education through their HEEE, develop students E&I capabilities and co-create an evolving HEEE for the future. Higher education that is transformative would enable youth with relevant skills for entrepreneurship and employment, leading to a better world and reducing the inequality of education across the globe.

Designing an HEEE requires a system perspective, staying true to the nature of ecosystems. Systems such as entrepreneurial ecosystems and HEEEs can be more or less systemic and change over time as factors and actors interact towards entrepreneurial performance (Malecki 2017). Understanding factors that facilitate student start-ups, entrepreneurial mindset and intentions contributing to the composition of HEEEs as in current HEEE studies are early work (Longva 2021; Webber, Kitagawa & Plumridge 2020; Guerrero, Urbano & Gajón 2020; Meyer et al. 2017; Wright, Siegel & Mustar 2017; Miller & Acs 2017; Rice, Feters & Greene 2014). Ecosystem actors are equally important to factors where respective stakeholders engage in the six identified contextual factors. However, this is complicated as these ecosystem actors tend to have their own goals and agenda that need to jointly be involved in the HEEEs for developing students E&I capabilities. Higher education institutions can champion their HEEE through a set of interdependent actors and factors, taking a system perspective.

Entrepreneurial ecosystems are regarded as contexts that can be co-created using design science approaches (O'Shea et al. 2019) and design principles can complement research on entrepreneurial ecosystems (Wurth et al. 2021). Given that HEEEs are a multi-stakeholder environment and based on the empirical evidence from this study, a human-centred strategy would be an effective approach to co-create an HEEE. Multiple stakeholders expressed the need for higher education institutions to understand the needs of key stakeholders. This involves designing the learning environment to develop E&I capabilities of students, while addressing the dynamics and challenges in a resource-constrained environment. The challenges faced by higher education institutions and their HEEEs are not problems that neatly fit within one discipline. These challenges are complex, interconnected and dynamic, and current solutions can become future problems, similar to any 'wicked' problem (Dorst 2015; Rittel & Webber 1973). Design thinking is a human-centred and interdisciplinary approach for solving wicked and ill-structured problems using an iterative prototyping method (Plattner, Meinel & Leifer 2010; 2015). Entrepreneurship education has benefited from using design thinking to disrupt teaching models (de Waal & Maritz 2021; Nielsen & Strovang 2015). Similarly, HEEEs could be at a competitive advantage by using design thinking to co-create and evolve, while addressing challenges in a resource-constrained environment.

Using an approach such as design thinking to co-create, evolve and scale an HEEE can leverage higher education institutions to integrate the needs of key stakeholders including students, parents and ecosystem actors and the requirements for business success, when

designing the learning environment to develop E&I capabilities. Such a strategy would draw together members from the various functions in the institution in understanding the different input from ecosystem actors and the broader environment on co-creating an HEEE. An inter-functional team using suitable tools and developing solutions that address problems in a free-thinking, learning and creative environment follows a design thinking process (Plattner, Meinel & Leifer 2020). This interconnectedness and interdependency would contribute to an impact that is broader and more effective than being institutionally driven and designed. Some practical implications for higher education institutions in resource-constrained environments are discussed in the sequence of discovery, design, development and delivery aligned to the phases of design thinking.

Design thinking takes the form of a seven-step process of understand, observe, define viewpoint, ideate, prototype, test and reflect (Plattner, Meinel & Leifer 2020). Higher education institutions can condense these seven steps to four practical phases that map with strategic planning – discovery, design, development and deliver. First, the higher education institution must discover by understanding the problem and challenges, observing the needs of key stakeholders, taking stock of resources and defining how they might arrive at a solution. To understand the status quo of the HEEE, higher education institutions can undertake an annual review of activities, performance and outcomes, then advance into relationships with ecosystem actors including students, parents, alumni, entrepreneurs and angel investors. A start would be to conduct a series of focus group discussions with key stakeholders including students to understand their needs, expectations and feedback on current HEEE activities. Next, it would be ideal to invite key stakeholders representing the entrepreneurial ecosystem to a graduate profiling meeting to take input and recommendations that would assist higher education institutions to achieve a closer alignment and integration of the HEEE with the wider entrepreneurial ecosystem. Discussing review results and recommendations with ecosystem stakeholders would be worthwhile to determine how they can play a role and contribute to achieving the value proposition that leads to the wider entrepreneurial ecosystem. Insights from this phase will enable higher education institutions to understand the HEEE in its entirety to improve and position for success and sustainability.

10.4 Limitations of the study

While limitations are common in any research, efforts were made to minimise limitations throughout the research process ensuring that the study contributes to the body of knowledge

and practice. This section is a broad disclaimer acknowledging all the limitations of the study including the place where the research is based, specific reference to time and special circumstances that warrant the generalisation of findings (Wolcott 1990).

The first limitation involves the geographic context of this study. Since the emergence of the concept, HEEE studies have been context specific. While a large proportion of studies have been based on universities in developed economies where the concept was born, this study took the initiative to explore HEEEs of private higher education institutions in a resource-constrained environment by focusing on an emerging economy, Sri Lanka. Higher education institutions in the Sri Lankan private sector play a pivotal role in supplying to the demand that public universities are constrained to satisfy. Some 150,000 students out of 250,000 qualify for higher education and approximately 92,000 want to pursue higher education (University Grants Commission 2022). However, public universities can only absorb 45,000 students, which is almost 50% of the demand, while private institutions cater to a little more than 10%, approximately 11,000 students (Sri Lanka Export Development Board 2018). Findings from this study are generalisable to some extent and applicable to developing countries with similar characteristics including private higher education institutions. Scholars can consider using these findings to test in similar developing countries and resource-constrained contexts. In this case, results would allow a comparison of HEEEs in resource-constrained contexts.

The second limitation of this study involves the special circumstances in which this study was conducted. Most HEEE studies emerged before the global pandemic. COVID-19 was declared in March 2020. One of the most recent HEEE studies published in mid-2021 has been in the publication process since end of 2020 and there is no indication of whether data was collected before the pandemic. Data collection for this study on HEEEs was during the pandemic. However, participants did not discuss the topic or relate to the pandemic during the two rounds of interviews (September to November 2020 and August to September 2021).

A limitation to keep in mind when interpreting findings from this study is that it has no representation of government bodies. Given the current nature of private higher education institutions in Sri Lanka and the low impact that the government domain has on these private businesses, government bodies were excluded as an ecosystem actor in data collection. The unit of analysis in this study was represented by higher education institutions and external stakeholders that hold interest or worked with HEEEs in some way. However, with emerging political instability and possibilities of a leadership change in Sri Lanka during the last stage

of this study, there could be no need to rule out the perceptions of government representatives in a future study. It could be worthwhile to take a policy lens on private higher education institutions including their HEEEs that can contribute to national priorities of E&I, including youth entrepreneurship and SMEs.

The study is also subject to the limitation that arises from scoping to draw broader perspectives from internal and external stakeholders, before investigating students. While the study focuses on students and the central theory framing is student centric, the study explores HEEEs through perspectives from deans/heads of schools, academics, alumni entrepreneurs, expert entrepreneurs, angel investors and support professionals. Students, the subjects experiencing HEEEs yet lacking real-world experiences, were understood to have limited external validity (Peterson 2001) and were seen as more suitable for investigation in a future study to advance the findings from this study.

The limitations of this study prevent the full exploration of HEEEs and future research directions could explore some of the limitations deemed relevant, including government bodies for a policy perspective on HEEEs and students' voice on the composition of HEEEs.

10.5 Future research directions

While there is much attention to entrepreneurship education and entrepreneurial ecosystems in the literature, it is unfortunate that there is less attention paid to HEEEs and how higher education institutions can develop their HEEEs. Future research directions are derived through findings where new questions emerge and limitations are described. Scholars may relate to these recommendations as research gaps and questions that might be of interest for further investigation, contributing to HEEE literature.

When exploring HEEEs in resource-constrained environments, some challenges that impede the development of HEEEs in Sri Lanka came to light in this study. However, exploring these challenges restricting HEEEs was not the main focus of this study and thus did not provide deeper insights into why these barriers exist in an emerging economy. Facilitating and hindering factors among higher education institutions in Finland has led to a more balanced understanding of HEEEs (Lahikainen, Peltonen & Ruskovaara 2019). Less focus has been put into understanding what is challenging HEEEs with resource constraints in developing countries within extant literature. Given that this study focused on Sri Lanka, scholars may want to investigate a comparative study of the factors acting as barriers towards HEEEs at institutional (micro) and national (macro) levels, in two or more developing countries,

illustrating ways HEEEs are impacted uniquely in geographically dispersed yet similar contexts. Such a study could provide an opportunity to understand if similar or different hindering factors are found in HEEEs of developing countries. This empirical evidence would contribute a holistic perspective of HEEEs in more resource-constrained environments.

Given the nature of higher education institutions in the private sector and the limited government influence on them embodied in Sri Lanka, representation of ministries was excluded from the sample and a policy lens was not pursued in this study. In other Asian countries, governments are making efforts to accelerate entrepreneurship education and improve the quality of higher education through policies (Yu 2018; Yu et al. 2017). Asian developing economies such as China, south-east economies such as Indonesia, Malaysia, Vietnam and Thailand, as well as South Asian developing economies including India and Bangladesh are steadily increasing E&I outcomes through various education-oriented policies (Weerasinghe & Jayawardane 2019). Policymakers should emphasise human capital development through education and training so that entrepreneurs are better prepared for running their start-ups in a resource-constrained environment, resulting in more successful ventures (de Brito, Lenz & Pacheco 2022). Through the evidence here, this is an important consideration for relevant government bodies in Sri Lanka to regulate private higher education in order to accelerate E&I for sustainable development. As a result, regulating private sector institutions will contribute to the SDG4 on quality education that focuses on increasing the number of youth with relevant skills for entrepreneurship (United Nations 2020). In the most recent national review of the SDGs, improvement areas are mapped to public universities and vocational education, overlooking private higher education institutions that have the potential to prepare students with relevant skills for entrepreneurship (Ministry of Sustainable Development 2018). For the way forward, future research that sets out policy, precautions and practices would be worthwhile to support policy planning and implementation that manifests outcomes including E&I capabilities among students in private higher education institutions.

This study specifically explored and understood the composition of HEEEs focused on developing E&I capabilities in a resource-constrained environment. Findings reveal six contextual factors and 18 mechanisms that higher education institutions can apply in their HEEEs. Further examination can verify specific factors and mechanisms that are effective for a particular higher education institution or a group of similar institutions in a given region. There are not many empirical studies examining the interdependences of such factors (Roundy, Bradshaw & Brockman 2018; Mack & Mayer 2016). Scholars may want to examine the

strength, impact and interdependences of HEEE factors among students, as an extension of this study, through a longitudinal study. Experimental research is ideal in this case where students' change can be assessed and evaluated as before-and-after scenarios. Given that there is a growing interest in uplifting the quality of education, aligned to SDG4, it would be a worthwhile project to focus on advancing HEEEs in Colombo, Sri Lanka. Similar projects, including Accelerating Higher Education Expansion and Development (AHEAD) and Improving Relevance and Quality of Undergraduate Education (IRQUE) funded by the World Bank, have supported the higher education sector, including private institutions, in Sri Lanka. Understanding the strength, impact and interdependences of HEEE factors through change in students' perspectives and behaviour would offer insights for higher education institutions on ways resources can be effectively utilised within contextual factors and mechanisms for high impact. This would also contribute a resourcing perspective to HEEE literature.

The final research question of this study paid attention to stakeholder engagement within the HEEE through a social capital perspective. Based on the future direction set by Alvedalen and Boschma (2017), entrepreneurial ecosystem studies including Neumeyer and Santos (2018; 2019) and Pittz, White and Zoller (2019) have applied social network analysis (SNA) to underline social network theory to explore social clusters and their connectivity. Scholars exploring HEEEs are yet to employ SNA techniques to examine relationship data, including strength of the networking relationships among higher education institutions and ecosystem actors. Such a study would advance the understanding of stakeholder engagement and social capital in HEEEs. Building relationships and social capital has been seen as an increasingly important resource for communities (Powell & Baker 2011), including students and higher education institutions. The SNA approach missing in the literature thus far might offer a much-needed analytical method to determine who needs to be part of the HEEE and the interplay between the six contextual factors, advancing the findings of this study; for instance, the strength of ecosystems actors that emerged in this study and the relationship effects for the configuration of HEEEs.

Extant literature including this study pay attention to the composition of HEEEs by discovering contextual factors and ecosystem actors. The findings of this study reveal the interference of 'challenges' in the environment and the importance of the 'people' involved in HEEEs in resource-constrained environments. As a result, higher education institutions could benefit by taking a human-centred approach to co-creating and evolving their HEEEs, such as design thinking. Design thinking has disrupted entrepreneurship education where teaching

models have been created for delivering higher education programs (Nielsen & Strovang 2015; de Waal & Maritz 2021). Using design thinking as an approach to co-create and evolve HEEEs may help higher education institutions to create better value, develop E&I capabilities for students, collaborate with ecosystem actors and overcome resource constraints. Studies can empirically explore design thinking and examine how design principles can be applied to advance HEEEs. In doing so, future research can examine the ways in which user-centricity, empathy, interdisciplinary teams, collaboration, ideation and other design thinking principles (Plattner, Meinel & Leifer 2020) become applicable for HEEEs. Qualitative research, particularly interviews with ecosystem actors, would lead to a deeper understanding of design thinking principles in the HEEE context and contribute to exploring the design perspective of HEEEs.

10.6 Chapter summary

This chapter clearly articulates the findings relating to the research questions, explains the significance of the findings, discusses contributions to theory and implications for practice, outlines the limitations and presents future research directions. The growth in HEEE literature has led to a multidisciplinary and fragmented canon. This study contributes to illustrating the relationship between HEEEs and students' E&I capabilities in a resource-constrained environment. The research contributes to theory by extending perspectives on how HEEE can develop students' E&I capabilities in a resource-constrained environment and contributions are made primarily to the domain of HEEE literature in the field of entrepreneurship. Implications for higher education institutions were explained regarding how they can continue the development of their HEEEs, pay attention to E&I capabilities of students and contribute to the entrepreneurial ecosystem. Limitations of the study are discussed in relation to the geographic context, specific reference to timeframe and special circumstances that warrant the generalisation of findings. Future research is proposed to take new perspectives including design, leadership, resourcing and balanced aligning to insights and queries that have raised from this study. The study and this chapter close with this summary.

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APPENDIXES

Appendix A: Research ethics

AI Ethics approval email



donotreply@infonetica.net

To: Christopher Selvarajah

Cc: RES Ethics; NILUSHA GALLAGE; Richard Laferriere



Thu 17/09/2020 6:03 PM



Letter.pdf

147 KB



Dear All,

Ref: 20202915-5183 : Developing Graduate Entrepreneurs: A model of Entrepreneurship Education and Experience for Private Higher Education Institutes in Colombo, Sri Lanka

Your ethics application has been approved. Please see the attachment for details of the approval.

Please contact the Swinburne [Research Ethics Office](#) if you have any queries.

Regards,

Ms Leah Barham

Research Ethics Office

Swinburne University of Technology

P: +61 3 9214 8145 | E: resethics@swin.edu.au

A2 Ethics approval certificate

Swinburne University of Technology Human Research Ethics Committee

Approval certificate



17/09/2020

The ethics application for your project Developing Graduate Entrepreneurs: A model of Entrepreneurship Education and Experience for Private Higher Education Institutes in Colombo, Sri Lanka has been approved.

Chief Investigator: Christopher Selvarajah

Ref: 20202915-5183

Approved Duration: 17/09/2020 to 17/09/2022

I refer to the ethical review of the above project protocol by Swinburne's Human Research Ethics Committee (SUHREC) or its sub-committees.

I am pleased to advise that, as submitted to date, the project may proceed in line with standard on-going ethics clearance conditions outlined below.

- The approved duration is as shown above unless an extension request is subsequently approved.
- All human research activity undertaken under Swinburne auspices must conform to Swinburne and external regulatory standards, including the *National Statement on Ethical Conduct in Human Research (2018)* and with respect to secure data use, retention and disposal.
- The named Swinburne Chief Investigator/Supervisor remains responsible for any personnel appointed to or associated with the project being made aware of ethics clearance conditions, including research and consent procedures or instruments approved. Any change in Chief Investigator/Supervisor, and addition or removal of other personnel/students from the project, requires timely notification and SUHREC endorsement.
- The above project has been approved as submitted for ethical review by or on behalf of SUHREC. Amendments to approved procedures or instruments ordinarily require prior ethical appraisal/clearance from SUHREC for approval. SUHREC must be notified immediately or as soon as possible thereafter of (a) any serious or unexpected adverse effects on participants and any redress measures; (b) proposed changes in protocols; and (c) unforeseen events which might affect continued ethical acceptability of the project.
- At a minimum, an annual report on the progress of the project is required as well as at the conclusion (or abandonment) of the project.
- A duly authorised external or internal audit of the project may be undertaken at any time.
- Please forward this approval certificate to relevant members of the project team.

This research project was approved during COVID-19 restrictions. The conduct of the research during this period should reflect any changes in relation to university and government COVID-19 mandates in the relevant jurisdictions. To ensure you have accommodated these mandates please refer to the Swinburne Ethics COVID-19 website [here](#).

The following investigators have been approved to work on the project:

Chief Investigator

Christopher Selvarajah

Associate Investigators

Richard Laferriere

Student Investigators

Nilusha Gallage

Please contact the Swinburne [Research Ethics Office](#) if you have any queries.

Regards,

Ms Leah Barham

on behalf of

Research Ethics Office

Swinburne University of Technology

P: +61 3 9214 8145 | E: resethics@swin.edu.au

A3 Change of chief investigator

20/08/2021

Ref: 20212915-8256 : Developing Graduate Entrepreneurs: A model of Entrepreneurship Education and Experience for Private Higher Education Institutes in Colombo, Sri Lanka



Approved Duration: 17/09/2020 to 17/09/2022

Chief Investigator: Viet Le

I refer to your request to modify the approved protocol for the above project. The request was put to a SUHREC/SHESC delegate for consideration.

I am pleased to advise that, as modified to date, the project may continue in line with standard ethics clearance conditions previously communicated and reprinted below. Please note that information on self-auditing, progress/final reporting and modifications/additions to approved protocols can now be found on the Research Ethics Internet pages.

Please contact the Research Ethics Office if you have any queries about on-going ethics clearance, citing the project number. A copy of this correspondence should be retained as part of project record-keeping and forwarded to relevant members of the project team.

This modification was approved during COVID-19 restrictions. The conduct of the research during this period should reflect any changes in relation to university and government COVID-19 mandates in the relevant jurisdictions. To ensure you have accommodated these mandates please refer to the Swinburne Ethics COVID-19 website [here](#).

As before, best wishes for the project.

Yours sincerely,

Ms Leah Barham

Research Ethics Office

Swinburne University of Technology

P: +61 3 9214 8145 | E: reethics@swin.edu.au

A4 Final ethics report acceptance email



Astrid Nordmann

To: Viet Le; Nilusha Gallage

Cc: RES Ethics



Wed 7/6/2022 8:20 AM

Dear Viet and Nilusha

This report has now been approved.

Kind regards

Astrid



Dr Astrid Nordmann | Research Ethics Coordinator
Research Services | Swinburne University of Technology
Ph +61 3 9214 3845 | anordmann@swin.edu.au
Level 1, Swinburne Place South
24 Wakefield St, Hawthorn VIC 3122, Australia
www.swinburne.edu.au

From: donotreply@infonetica.net <donotreply@infonetica.net>

Sent: Wednesday, 6 July 2022 8:20 AM

To: Christopher Selvarajah <cselvarajah@swin.edu.au>

Cc: RES Ethics <resethics@swin.edu.au>

Subject: Acknowledgement of Final Report for 20222915-10250

Dear Viet ,

The Final Report for project 20222915-10250 : Developing Graduate Entrepreneurs: A model of Entrepreneurship Education and Experience for Private Higher Education Institutes in Colombo, Sri Lanka has been processed and satisfies the reporting requirements set under the terms of ethics clearance.

Regards,

Dr Astrid Nordmann

Research Ethics Office

Swinburne University of Technology

P: +61 3 9214 3845 | E: resethics@swin.edu.au

Appendix B: Qualitative data collection

B1 Interview protocol for internal stakeholders

INTERVIEW PROTOCOL FOR INTERNAL STAKEHOLDERS		
Basic Information:		
Title: Graduate Entrepreneurship: A model of Entrepreneurship Education and Experience for Private Higher education providers in Sri Lanka		
Date:	Time:	Interviewer: NG
Interviewee:	Institution:	Transcription Code:
Introduction:		
<p>I am Nilusha Gallage and I am pursuing my PhD at Swinburne University, Melbourne. Previously I was an academic at a leading private higher education institute in Sri Lanka. The purpose of this study is to explore how institutes can facilitate its students from various fields of study within its environment to become entrepreneurs. The interview will include eight to ten questions and should take 30–45 minutes. Feel free to ask me any questions you may have now or at the end of the interview. Before beginning this interview, I request your consent to participate in this interview and if you agree please on the reverse of this document.</p>		
Opening Question: Is entrepreneurship encouraged among students at your institution? And tell me about the student population in terms of the various disciplines.		
Content Questions:		
<ol style="list-style-type: none">1. What is your opinion of the higher education entrepreneurial ecosystems at your institution? ecosystems in the private higher education sector?2. How do you perceive the future development of the higher education entrepreneurial ecosystem at your institution? What should the institutions focus on as student related outcome(s) achieving through their ecosystem?3. Does the institution offer a degree in entrepreneurship? What is the availability of entrepreneurship education study programs for undergraduates in private higher education?4. What types of entrepreneurial support is available for students within the higher education entrepreneurial ecosystems?5. How are stakeholders currently involved in higher education entrepreneurial ecosystems? Who do you see as key stakeholders of HEEEs? How can stakeholders engage within factors/activities you mentioned earlier?6. How do you see yourself supporting higher education entrepreneurial ecosystems in the future?		
Closing Question: In this interview, we discussed regarding higher education entrepreneurial ecosystems including entrepreneurship education and entrepreneurial support. Is there anything else that you would like to state or share your comments related to the same?		
Closing Instructions:		
<p>Thank you for participating in this research. It was interesting and important to know your opinions and perceptions. I assure the confidentiality of this interview. Once the PhD thesis is submitted, the abstract will be shared with you and when publications leading from the research are published, the links will be communicated as well. Feel free to ask any questions you may have.</p>		

B2 Interview protocol for external stakeholders

INTERVIEW PROTOCOL FOR EXTERNAL STAKEHOLDERS

Basic Information:

Title: Graduate Entrepreneurship: A model of Entrepreneurship Education and Experience for Private Higher education providers in Sri Lanka		
Date:	Time:	Interviewer: NG
Interviewee:	Institution:	Transcription Code:

Introduction:

I am Nilusha Gallage and I am pursuing my PhD at Swinburne University, Melbourne. Previously I was an academic at a leading private higher education institute in Sri Lanka. The purpose of this study is to explore how institutes can facilitate its students from various fields of study within its environment to become entrepreneurs. The interview will include eight to ten questions and should take 30–45 minutes. Feel free to ask me any questions you may have now or at the end of the interview. Before beginning this interview, I request your consent to participate in this interview and if you agree please on the reverse of this document.

Opening Question: Do young entrepreneurs benefit from higher education? And what is the role of private institution in nurturing graduate entrepreneurs?

Content Questions:

1. What is your opinion of current higher education entrepreneurial ecosystems among private higher education institutions?
2. How do you perceive the future development of these higher education entrepreneurial ecosystems? What should higher education institutions focus on as student related outcome(s) achieving through their ecosystem?
3. How is the availability of entrepreneurship education study programs for undergraduates in private higher education?
4. What types of entrepreneurial support is available for students within the higher education entrepreneurial ecosystems?
5. How are stakeholders currently involved in higher education entrepreneurial ecosystems? Who do you see as key stakeholders of HEEEs? How can stakeholders engage within factors/activities you mentioned earlier?
6. How do you see yourself engaging with higher education entrepreneurial ecosystems in the future?

Closing Question: In this interview, we discussed regarding higher education entrepreneurial ecosystems including entrepreneurship education and entrepreneurial support. Is there anything else that you would like to state or share your comments related to the same?

Closing Instructions:

Thank you for participating in this research. It was interesting and important to know your opinions and perceptions. I assure the confidentiality of this interview. Once the PhD thesis is submitted, the abstract will be shared with you and when publications leading from the research are published, the links will be communicated as well. Feel free to ask any questions you may have.

B3 Participant information statement

Project Title

Developing Graduate Entrepreneurs: A model of entrepreneurship education and experience for Private Higher Education Institutes in Colombo, Sri Lanka

Investigators and Other Project Personnel

Researcher	Position	Affiliation
Professor Christopher Selvarajah	Chief Investigator	Swinburne University of Technology, Melbourne
Dr Richard Laferriere	Associate Supervisor	
Nilusha Gallage	Student investigator	

Introduction to Project and Invitation to Participate

This research project is a part of the doctoral studies undertaken by the student investigator, Nilusha Gallage, and supervised by Professor Christopher Selvarajah and Dr Richard Laferriere at Swinburne University in Melbourne. The project intends to explore in the context of private higher education institutes in Colombo, Sri Lanka; How can entrepreneurship education help undergraduates to become graduate entrepreneurs? To pursue this project, we would like to invite you, as a member of the private higher education sector and/or a stakeholder of the entrepreneurship education system, to participate in an online interview relating to entrepreneurship education. In doing so we solicit participants' perceptions and experiences on private higher education and/or entrepreneurship education in Sri Lanka.

For this project, we seek participation from individuals and organisations relevant to the study. If you are a top management representative of a private higher education institute, please authorise faculty/academics and mentors to participate in this research. You can do this by providing the names and email addresses of nominees in the consent form, which will be forwarded via email if you are willing to take part in this research. If you are an individual such as an entrepreneur or a top management representative of an incubator organisation, you are invited to participate in the project. Each participant, including nominees, is invited to voluntary participation in this research.

Project Rationale

To address the national challenge of youth unemployment and underemployment in Sri Lanka, this research explores the entrepreneurial development needs of undergraduate students towards becoming entrepreneurial after completing their first degree at Private Higher Education Institutes. This project will investigate how undergraduate education shapes the entrepreneurial intention of aspiring young graduates. With your insights, we will be able to develop and propose a *Model of Entrepreneurship Education and Experience for Private Higher Education Providers* that will be useful for academic researchers, industry practitioners, policymakers and other stakeholders. The findings of the project will be produced as a thesis and publications such as academic journal articles and book chapters.

Researcher's interests

This project is being undertaken to satisfy the requirements for the completion of a PhD qualification currently being undertaken by the Student Investigator, Nilusha Gallage, at Swinburne University of Technology in Melbourne, Australia.

Participation in this project

This research will be one of the first studies in Sri Lanka to include perspectives from five stakeholders in a study on entrepreneurship education. Therefore, the research will involve the participation of two groups: (1) faculty/academics and mentors from institutes and (2) alumnus, expert entrepreneurs, and top management of incubator organisations. If you represent one of these positions, you are invited to voluntary participation in this study.

After understanding the importance of this project, if you decide to participate, you are expected to take part in an online interview with the student investigator on a date and time that is convenient to you during the data collection period. It is anticipated that the interview will take approximately 30 to 45 minutes depending on the willingness and availability of the interviewee. This could also be shorter or longer according to your experience and discussion in the research area. You are not required to supply any confidential data during the interview or company records for this study. The interviewee's consent to participate will be requested before conducting the interview where the consent form will be forwarded via email to be signed and reverted before the interview. Upon your consent, the interview will be conducted through Skype or Zoom by the student investigator, and information on connecting to the interview will be shared well in advance after consent to participate is received and a date/time is scheduled. The semi-structured interview involves 10 questions on entrepreneurship education in the Sri Lankan context and follows up questions that may arise during the interview. The online interview will be recorded with the participant's consent and recordings will be held only with the research team. All collected data will remain private confidential and are used only for the study.

The participation in this interview is voluntary, with no implicit or explicit coercion to participate. Even if you are nominated to participate, it is your independent choice to participate. Your participation will contribute towards the research findings in entrepreneurship education which can create an economic and social impact in the future for Sri Lanka. Participating private higher education institutes will be invited to phase two data collection which will involve gathering students' perceptions of entrepreneurship education via a survey questionnaire.

Risks and Benefits

The project intends to capture your genuine perceptions and opinions on entrepreneurship education provided by private higher education institutes in Sri Lanka. It is a time relevant topic to engage and share your experiences as an individual/organisation representing the entrepreneurship education ecosystem. This research will establish evidence-based findings on entrepreneurial development needs that can contribute to support aspiring young entrepreneurs in starting a business venture after completing the first degree. Suggested managerial directions will aid to reform private higher education in Sri Lanka for the future of undergraduate education. The start-up ventures that will emerge may result in an economic and societal benefit for the country and its community. Especially, the recommendations of actions will contribute to resolving the youth unemployment and underemployment that Sri Lanka is

currently suffering. These findings will still relate to developing graduate entrepreneurs post COVID-19.

There are no known risks associated with the participant of this research in either the short or long term. To avoid deception, the interviewee/participant is provided with all related information through this explanatory statement. The interviewee will be requested to inform consent of participation before the interview. Should the participant decide not to undertake in this research, there is no risk to bear. This confirms that participation in this interview is voluntary, with no implicit or explicit coercion to participate.

Participants are invited to answer questions based on an individual reflection of entrepreneurship education in a private conversation with the student investigator. If any adverse event may occur during or after the interview, you may contact your immediate supervisor or the student investigator will direct suitable assistance to avoid any psychological risk. As professionals in respective fields, all your genuine feedback is accepted and kept strictly confidential. In case, if any negative information is shared by the participant during the interview this information will be managed accordingly posing no risk or harm to anyone or any organisation. All interview responses are de-identified and collectively analysed which means there is no possibility to identify or divulge the source of negative comments. Further, the project will maintain confidentiality when discussing and publishing findings which means it will not state that 'Participant's Name' from 'Organisation's Name' made this comment. If any quotes are shared in findings, the specifics of the participant will not be disclosed maintaining research ethics. Secure data management will be practiced at all points of the project including data collection and analysis.

Free Consent and Withdrawal from Participation

Participation in this research requires informed 'consent' from respondents. Management representatives of institutes require to provide consent and authorise employees as representatives to participate as an institute. Nominated employees, alumnus, entrepreneurs and top management members of the incubator organisations will be invited to provide written consent to participate in the study as an individual. Therefore, there are two consent forms – one for authorising employees and the other for individuals. The appropriate consent form will be sent via email to you in the second email. The participant will be requested to sign off consent before confirming the online interview and participating in the interview. The signed consent of participation must be returned to the researcher via email and will be securely retained by the researcher where only the research team will have access to the signed consent form, contact information and interview data.

If you decide to participate in the research, you have the right to avoid any question(s) that they may not wish to answer, pause, or withdraw from the study at any time. You may terminate the interview during the interview and/or withdraw the interview data from the research project during three months after the completion of your interview. You can contact the student investigator and communicate that you wish to be excluded from the interview data by completing the withdrawal of the consent form.

Privacy and Confidentiality

This research involving humans has been reviewed and approved by the Swinburne's Human Research Ethics Committee (SUHREC) in line with the National Statement on Ethical Conduct in Human

Research (2008). All information related to participating in this research and interview data will be kept strictly confidential. All data is subject to standards of the Swinburne University Code of Ethics 2008.

All possible measures are taken to maintain privacy and confidentiality while minimising any possible risks for the participants of this study.

1. Prospective research participants for data collection are contacted by the student investigator and no contact details (such as telephone numbers and email addresses) are made available to Swinburne or any external party. This contact information is recorded and stored in access-controlled storage.
2. Each participant, even if nominated by the employer, has the right to consent given that this is a voluntary study. Participants are informed of their consent in the email/LinkedIn invitation, participant information sheet and consent form itself.
3. All communication between participant and researcher including interview responses will be kept private and confidential.
4. If a participant decides to accept the invitation and engage in the online interview, the electronically signed consent form will be retained by the researcher and only the research team will have access to the secured data storage.
5. Online interviews will be a private conversation between participant and researcher on a secure video-conferencing meeting at convenience.
6. Recorded interviews will be transcribed by the researcher after de-identifying the participant.
7. Analysis of interview data will take place collectively using relevant software with password protection, which means the study will not assess findings individually.
8. If any negative information is shared by the participant during the interview this information will be managed accordingly posing no risk or harm to anyone or any organisation. Interview data is de-identified when transcribed and collectively analysed giving no possible to identify the source.
9. Secure data management will be practiced at all points of the project including data collection and analysis. This will include the contact information of participants, their signed consent forms and interview data.
10. There will be no loose hard copy data such as interview notes.
11. The interview data will be retained for a minimum of five years after the research outcomes.
12. There is no involvement of any external company during the data collection, preparation, or analysis. All data will only be accessible by the research team listed above.
13. The study will preserve the confidentiality of participants when discussing and publishing findings.

Research output

This qualitative study including online interviews will be used as the basis for the next phase of quantitative research among the student population. From this project, the research output will be a PhD. Thesis which is equivalent to 70,000 – 100,000 words, and a submission presentation fulfilling the academic requirement at Swinburne University. The research findings will also be published in academic journals and a book chapter. When research findings are published, the source in the form of a link or PDF document will be shared among participated individuals, institutes and organisations.

Collected interview data may be used for future research in building a longitudinal study within the same research problem or for an emerging research gap related to entrepreneurship education. If you consent and participate in this study, you may be contacted for future related research as well. You have the opportunity to express your interest in this on the consent form. However, it will be voluntary participation giving you the ability to decide on your participation in future studies.

Support Services

If you require any counselling or support services, please contact your immediate supervisor. Alternatively, you have access to the below helpline: For free telephone counselling service in Sri Lanka dial 1333

Further information about the project

If you would like further information about the project, please contact:

Chief Investigator
Prof. Christopher Selvarajah
School Business, Law and Entrepreneurship
Swinburne University of Technology
Email: cselvarajah@swin.edu.au

If you would like further information about the interview or project, please contact:

Student Investigator
Nilusha Gallage
School Business, Law and Entrepreneurship
Swinburne University of Technology
Email: ngallage@swin.edu.au

Concerns/complaints about the project

This project has been approved by or on behalf of Swinburne's Human Research Ethics Committee (SUHREC) in line with the National Statement on Ethical Conduct in Human Research. If you have any concerns or complaints about the conduct of this project, you can contact:

Research Ethics Officer, Swinburne Research (H68),
Swinburne University of Technology,
P O Box 218, Hawthorn VIC 3122 Australia.
+61392143845

B4 Consent instrument for authorising employees



Swinburne University of Technology

Project Title: Developing Graduate Entrepreneurship: A model of entrepreneurship education and experience for Private Higher education providers in Colombo, Sri Lanka

Principal Investigator: Professor Christopher Selvarajah

1. **On behalf of:**(Name of Organisation)

I hereby authorise the following employee(s) to participate in the project in a representative capacity, the project's particulars having been satisfactorily explained to me:

Name of representative(s): and

2. **In relation to this project, please circle your response to the following:**

- I agree that s/he can be interviewed by the researcher **Yes No**
- I agree that the interview can be recorded by electronic device **Yes No**
- I would like to check any transcription / citation in respect of my organisation's involvement for accuracy **Yes No**

3. **Please circle your response to the following:**

- I give my permission for the organisation to be named in any publication arising from the research. **Yes No**
- I further give my permission for the named researcher(s) to access/analyse organisational records as requested. **Yes No**
- I understand the length of time researcher(s) will have access to data/records for analysis **Yes No**

4. I acknowledge that the data collected for the Swinburne project will be used for research purposes and not for direct profit; research purposes may include publishable / peer reviewed outcomes.

Name of Person of Authority and Position:

Signature and Date

B5 Consent instrument for individual interviewees



Swinburne University of Technology

Project Title: Developing Graduate Entrepreneurship: A model of entrepreneurship education and experience for private higher education providers in Colombo, Sri Lanka

Principal Investigator(s): Prof. Christopher Selvarajah

1. I consent to participate in the project named above. I have been provided a copy of the project consent information statement to which this consent form relates and any questions I have asked have been answered to my satisfaction.

2. *In relation to this project, please circle your response to the following:*

- | | | |
|--|------------|-----------|
| ▪ I agree to be interviewed by the researcher | Yes | No |
| ▪ I agree to allow the interview to be recorded by electronic device | Yes | No |
| ▪ I agree to make myself available for further information if required | Yes | No |

3. I acknowledge that:

- (a) my participation is voluntary and that I am free to withdraw from the project at any time without explanation;
- (b) the Swinburne project is for the purpose of research and not for profit;
- (c) any identifiable information about me which is gathered in the course of and as the result of my participating in this project will be (i) collected and retained for the purpose of this project and (ii) accessed and analysed by the researcher(s) for the purpose of conducting this project;
- (d) I understand the length of time researcher/s will have access to this information;
- (e) my anonymity is preserved and I will not be identified in publications or otherwise without my express written consent.

By signing this document I agree to participate in this project.

Name of Participant:

Signature and Date:

B6 Email invitation

Dear <name>,

RE: Invitation to participate in an interview for research on Higher Education Entrepreneurial Ecosystems

I am Nilusha Gallage and I am pursuing my PhD at Swinburne University, Melbourne. My research is titled as ‘Developing Graduate Entrepreneurs: A model of Entrepreneurship and experience for Private Higher education providers in Colombo, Sri Lanka’ and the study is supervised by Professor Christopher Selvarajah and Dr Richard Laferriere from the Faculty of Business and Law. Previously I was an academic at a leading private higher education institute in Sri Lanka. You may view my LinkedIn profile on <https://www.linkedin.com/in/nilushagallage/> for my background.

The purpose of this research is to explore how private higher education providers located in Colombo can develop their students towards entrepreneurship. Therefore, we would like to know, as a member of the private higher education sector and/or a stakeholder of the ecosystem, how this is addressed. As you are identified as an important stakeholder who can tell us about your perceptions and experiences of private higher education, its ecosystem and/or youth entrepreneurship in Sri Lanka, we invite you or an authorised representative(s) to participate in an online interview at a convenient date and time. The interview includes ten questions and should take no longer than 30–45 minutes of the participant’s time.

For more information, I have attached the Consent Information Sheet explaining the project, its rationale, interests, risks and benefits, consent, privacy and confidentiality, research output and contact information. Your participation in this research is voluntary and I look forward to hearing your response. If you are willing to contribute to the study, please respond to this email to arrange a date and time for interviewing at your convenience. If you have any questions at this stage, please feel free to get back to me.

Thanking you in advance.

Best regards,

Student Investigator / PhD Candidate
Nilusha Gallage
School of Business, Law and Entrepreneurship
Swinburne University of Information Technology
Email: ngallage@swin.edu.au

Appendix C: Graduate Certificate of Research and Innovation Management

Year	Study Period	Unit	Short Title	Ver	Mark	Grade Code	Grade Description	Credit Points
2021	Semester 2	BUS80017	Quantitative Research Methods	1	78	D	Distinction	12.50
2020	Semester 2	BUS80018	Qualitative Research Methods	1	80	HD	High Distinction	12.50
2019	Winter	ENT60010	Innovation and Impact in Research	2	84	HD	High Distinction	12.50
2019	Winter	INF60016	Project Management for Research	2	90	HD	High Distinction	12.50

Appendix D: Publication information



Swinburne Research

Authorship Indication Form

For HDR students

NOTE

This Authorship Indication form is a statement detailing the percentage of the contribution of each author in each submitted/published 'paper'. This form must be signed by each co-author and the Principal Supervisor. This form must be added to the publication of your final thesis as an appendix. Please fill out a separate form for each published paper to be included in your thesis.

DECLARATION

We hereby declare our contribution to the publication of the 'paper' entitled:

Ecosystem Engagement in Entrepreneurship Education: A View from Sri Lanka

First Author

Name Nilusha Gallage

Signature: 

Percentage of contribution: 85%

Date: 18 / 05 / 2022

Brief description of contribution to the 'paper' and your central responsibilities/role on project:

Conceptualisation, methodology, investigation, data analysis, writing and visualisation

Second Author

Name: Dr Richard Laferriere

Signature: 

Percentage of contribution: 10 %

Date: 05 / 08 / 2022

Brief description of your contribution to the 'paper':

Conceptualisation and validation

Third Author

Name: Professor Christopher Selvarajah

Signature: 

Percentage of contribution: 05%

Date: 08 / 07 / 2022

Brief description of your contribution to the 'paper':

Supervision

Fourth Author

Name: _____ Signature: _____

Percentage of contribution: ____%

Date: __/__/____

Brief description of your contribution to the 'paper':

Principal Supervisor: Name: <u> Viet Le </u> Signature: <u> <i>Viet</i> </u> Date: <u> 05 / 08 / 2022 </u>
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In the case of more than four authors please attach another sheet with the names, signatures and contribution of the authors.

Authorship Indication Form



Authorship Indication Form

For HDR students

NOTE

This Authorship Indication form is a statement detailing the percentage of the contribution of each author in each submitted/published 'paper'. This form must be signed by each co-author and the Principal Supervisor. This form must be added to the publication of your final thesis as an appendix. Please fill out a separate form for each published paper to be included in your thesis.

DECLARATION

We hereby declare our contribution to the publication of the 'paper' entitled:

Higher education entrepreneurial ecosystems for students' entrepreneurial development

First Author

Name: Nilusha Gallage

Signature: 

Percentage of contribution: 90 %

Date: 18/05/2022

Brief description of contribution to the 'paper' and your central responsibilities/role on project:

Conceptualisation, methodology, investigation, data analysis, writing and visualisation

Second Author

Name: Dr Viet Le

Signature: 

Percentage of contribution: 05 %

Date: 06/07/22

Brief description of your contribution to the 'paper':

Validation and supervision

Third Author

Name: Dr Richard Laferriere

Signature: 

Percentage of contribution: 05 %

Date: 05/08/2022

Brief description of your contribution to the 'paper':

Supervision


Fourth Author

Name: _____ Signature: _____

Percentage of contribution: ____%

Date: __/__/____

Brief description of your contribution to the 'paper':

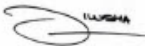

Principal Supervisor: Name: <u>Dr Viet Le</u> Signature:  Date: <u>05/08/22</u>
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In the case of more than four authors please attach another sheet with the names, signatures and contribution of the authors.

Appendix E: Change of thesis title



Swinburne Research Change of Thesis Title

PLEASE READ BEFORE COMPLETING FORM	
<p>A Change of Thesis Title involves altering the wording of the research title in order to more accurately and more clearly reflect the nature of the topic. This refinement does not involve a change in topic or research area or necessitate any other change in candidature.</p> <p><i>If the topic of your thesis is being changed, do not complete this form. Please complete the Change of Research Project Topic instead.</i></p> <p>Higher Degree by Research candidates must obtain approval for a requested title change from their Principal Supervisor. Upon approval, the completed form should be emailed to HDRcandidature@swin.edu.au.</p> <p>This form will be kept on your student record in accordance with University Privacy Policy. The Swinburne University of Technology Privacy Policy can be viewed at: http://www.swinburne.edu.au/corporate/registrar/privacy_collection.htm</p>	
SECTION A: PERSONAL DETAILS	
Surname or Family Name: Gallage	Given Names: Nilusha Gayani
Student ID: 102364009	Program of Enrolment: Doctor of Philosophy
Faculty of Enrolment: <input checked="" type="checkbox"/> FBL <input type="checkbox"/> FHAD <input type="checkbox"/> FSET	
School / Centre / Department: School of Business, Law, and Entrepreneurship	
SECTION B: CHANGE OF THESIS TITLE REQUEST	
Candidate to complete Section B if request is a change to the wording of the title only and does not involve a change in research topic or area.	
Current Title: Developing graduate entrepreneurs: A model of entrepreneurship education for private higher education providers in Colombo, Sri Lanka	
Proposed New Title: An exploratory study of multiple stakeholder views on higher education entrepreneurial ecosystems in a resource-constrained environment	
Reason for change in title: The current title was tentatively set at the beginning of the doctoral study and after completing the study, the proposed title reflects the nature of study more accurately and clearly. It is not a change of topic.	
I confirm that this change to the wording of the research title is requested in order to more accurately and more clearly reflect the nature of the topic. This requested change does not involve a change in project topic or research area or necessitate any other change in candidature.	
<p>Candidature Signature: </p> <p>Date: 21 Jun 2022</p>	
SECTION C: PRINCIPAL SUPERVISOR APPROVAL	
Name of Principal Supervisor:	
I confirm that this change to the wording of the research title is approved in order to more accurately and more clearly reflect the nature of the topic. This approved change does not involve a change in project topic or research area or necessitate any other change in candidature.	
<p>Principal Supervisor Signature: </p> <p>Date: 22 June 2022</p>	

Updated June 2019