T.R.

ISTANBUL SABAHATTIN ZAIM UNIVERSITY

GRADUATE SCHOOL OF EDUCATION

DEPARTMENT OF ISLAMIC ECONOMICS AND FINANCE

SUSTAINABLE ENTREPRENEURSHIP FOR SMES: A COMPARATIVE STUDY OF CONVENTIONAL AND ISLAMIC APPROACHES

Ph.D. DISSERTATION

MUHAMMAD HASSAN ABBAS

Istanbul

June-2025

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Supervisor

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This study has been approved in partial fulfillment of the requirements for Ph.D. Degree in Islamic Economics and Finance.

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DECLARATION OF SCIENTIFIC ETHICS AND ORIGINALITY

This is to certify that this PhD thesis titled “SUSTAINABLE ENTREPRENEURSHIP FOR SMES: A COMPARATIVE STUDY OF CONVENTIONAL AND ISLAMIC APPROACHES” is my own work and I have acted according to scientific ethics and academic rules while producing it. I have collected and used all information and data according to scientific ethics and guidelines on thesis writing of Sabahattin Zaim University. I have fully referenced, in both the text and bibliography, all direct and indirect quotations and all sources I have used in this work.

Muhammad Hassan ABBAS

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Muhammad Hassan ABBAS

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ABSTRACT

SUSTAINABLE ENTREPRENEURSHIP FOR SMES:

A COMPARATIVE STUDY OF CONVENTIONAL AND ISLAMIC APPROACHES

Muhammad Hassan ABBAS

Ph.D. Dissertation, Islamic Economics and Finance

Supervisor: Prof. Dr. Mehmet BULUT

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The concept of sustainable entrepreneurship in SMEs (small and medium enterprises) has acquired new importance these days for achieving sustainable development and better social development in an area. SMEs can incorporate environmental and social considerations into their business models so that the United Nations Sustainable Development Goals (SDGs) can be achieved. This study examines sustainability entrepreneurship in the SME sector through a comparative analysis of the conventional and the Islamic approach with an application to youth behavior in Pakistan and Türkiye. The research on sustainable entrepreneurship is increasing around the world, but most of the studies focus on secular models, thus ignoring the ethical and justice-oriented principles of Islam. This research seeks to provide a better framework to understand sustainability-driven entrepreneurial behavior by using the Theory of Planned Behavior in conjunction with adl (justice), shura (participation), and falah (purposeful prosperity).

The research employed a mixed-methods design. Expert interviews with Islamic finance scholars and SME stakeholders produced qualitative insights to inform normative motivations and institutional realities. This was followed by a quantitative phase to gather survey data from more than 500 university students and early-stage entrepreneurs from Pakistan and Türkiye, and an interpretation of Data. The data were analyzed by means of Partial Least Squares Structural Equation Modeling (PLS-SEM) to determine the effect of attitudes toward entrepreneurship, social norms, perceived barriers, self-efficacy, and intention on sustainable entrepreneurial behavior.

The results showed that in mainstream thinking on consumer behavior, cognitive and environmental factors are given support. However, Islamic approaches added more dimensions to the moral group. The research study shows how entrepreneurial intention positively impacts sustainable behavior and is further moderated by entrepreneurial education and institutional support. Notably, respondents from Türkiye showed higher behavioral intentions than those from Pakistan. This was due to a more supportive educational infrastructure and enabling situational factors. Insights reveal essential gaps and opportunities that suggest concrete implications for policy design, curriculum development, and ecosystem building to bolster sustainable entrepreneurship in both contexts.

Keywords: Sustainable Entrepreneurship, SMEs, Islamic Economics, Theory of Planned Behavior, PLS-SEM, Pakistan, Türkiye, Maqasid Al-Shariah, Entrepreneurial Education

ÖZET

KOBİ'ler için Sürdürülebilir Girişimcilik: Konvansiyonel ve İslami Yaklaşımların Karşılaştırılmalı Bir İncelemesi

Muhammad Hassan ABBAS

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KOBİ'lerde (küçük ve orta ölçekli işletmeler) sürdürülebilir girişimcilik kavramı, sürdürülebilir kalkınmanın yanı sıra bir bölgede daha iyi sosyal gelişmelerin sağlanması için bugünlerde yeni bir önem kazanmıştır. KOBİ'ler, Birleşmiş Milletler Sürdürülebilir Kalkınma Hedeflerine (SKH'ler) ulaşılabilmesi için çevresel ve sosyal konuları iş modellerine dahil edebilirler. Bu çalışma, Pakistan ve Türkiye'deki gençlerin davranışları üzerine bir uygulama ile geleneksel ve İslami yaklaşımın karşılaştırmalı bir analizi yoluyla KOBİ sektöründe sürdürülebilir girişimciliği incelemektedir. Sürdürülebilir girişimcilik üzerine yapılan araştırmalar dünya çapında artmaktadır, ancak çalışmaların çoğu seküler modellere odaklanmakta, dolayısıyla İslam'ın etik ve adalet odaklı ilkelerini göz ardı etmektedir. Bu araştırma, Planlı Davranış Teorisi'ni adl (adalet), şura (katılım) ve felah (amaca yönelik refah) ile birlikte kullanarak sürdürülebilirlik odaklı girişimcilik davranışını anlamak için daha iyi bir çerçeve sağlamayı amaçlamaktadır.

Araştırmada karma yöntem tasarımı kullanılmıştır. İslami finans akademisyenleri ve KOBİ paydaşlarıyla yapılan uzman mülakatları, normatif motivasyonlar ve kurumsal gerçeklikler hakkında bilgi vermek için niteliksel içgörüler üretmiştir. Bunu, Pakistan ve Türkiye'den 500'den fazla üniversite öğrencisi ve erken aşama girişimciden anket verileri toplamak için nicel bir aşama izlemiştir. Verilerin Yorumlanması. Veriler, girişimciliğe yönelik tutumların, sosyal normların, algılanan engellerin, öz yeterliliğin ve niyetin sürdürülebilir girişimcilik davranışı üzerindeki etkisini belirlemek için Kısmi En Küçük Kareler Yapısal Eşitlik Modellemesi (PLS-SEM) ile analiz edilmiştir.

Sonuçlar, tüketici davranışına ilişkin ana akım düşüncede bilişsel ve çevresel faktörlerin desteklendiğini göstermiştir. Ancak İslami yaklaşımlar daha fazla ahlaki

grup boyutu eklemiştir. Araştırma çalışması, girişimcilik niyetinin sürdürülebilir davranış üzerinde nasıl olumlu bir etkiye sahip olduğunu ve girişimcilik eğitimi ve kurumsal destek tarafından nasıl yönetildiğini göstermektedir. Özellikle, Türkiye'den katılımcılar Pakistan'dan katılımcılara kıyasla daha yüksek davranışsal niyetler göstermiştir. Bunun nedeni daha destekleyici bir eğitim altyapısı ve elverişli durumsal faktörlerdir. İçgörüler, her iki bağlamda da sürdürülebilir girişimciliği desteklemek için politika tasarımı, müfredat geliştirme ve ekosistem oluşturma için somut çıkarımlar öneren temel boşlukları ve fırsatları ortaya koymaktadır.

Anahtar Kelimeler: Sürdürülebilir Girişimcilik, KOBİ'ler, İslam Ekonomisi, Planlı Davranış Teorisi, PLS-SEM, Pakistan, Türkiye, Makasıd-I Şeriat, Girişimcilik Eğitimi

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BIC	:	Business Incubation Centers
CB	:	Covariance-Based
CBAM	:	Carbon Border Adjustment Mechanism
CSR	:	Corporate Social Responsibility
CSRD	:	Corporate Sustainability Reporting Directive
DBL	:	Double Bottom Line
EI	:	Emotional Intelligence
ENT-Att	:	Entrepreneurial Attitude
Ent-Education	:	Entrepreneurial Education
Ent-SNorm	:	Entrepreneurial Subjective Norms
ESG	:	Environment, Social, and Governance
GDP	:	Gross Domestic Product
HEC	:	Higher Education Commission
HOP	:	Helping Other People Enthusiastically
IPMA	:	Impact-Performance Matrix Analysis
LNOB	:	Leave No One Behind
NDCs	:	Nationally Determined Contributions
NIC	:	National Incubation Center
P-Barrier	:	Perceived Barriers
PLS	:	Partial Least Square

Ps	:	People, Planet, Profit
RBV	:	Resource-Based View
SCT	:	Social Cognitive Theory
SDGs	:	Sustainable Development Goals
SEB	:	Sustainable Entrepreneurial Behavior
SEI	:	Sustainable Entrepreneurial Intentions
Self-Efy	:	Self-Efficacy
SEM	:	Structural Equation Model
SES	:	Social Ecological Systems
Situ-Factors	:	Situational Factors
SMEs	:	Small And Medium Enterprises
TBL	:	Triple Bottom Line
TPB	:	Theory Of Planned Behavior
UN	:	United Nations
WBCSD	:	World Business Council for Sustainable Development

CHAPTER I
INTRODUCTION

1.1. Introduction

This chapter aims to provide the background and reasons behind starting this research. It begins by reviewing previous studies to find what has not been studied yet, which helps set the research questions and goals. The chapter also explains what the research will cover and what it will not. After that, it discusses the theories used and how they apply to this study. In the end, the chapter outlines the research and provides a summary.

1.2. Research Background

In recent decades, entrepreneurship has attracted significant scholarly attention to its pivotal role in job creation and innovative economic development (Aljuwaiber, 2020). Authorities and international development agencies have greatly emphasized the promotion of entrepreneurship in society since it can effectively develop both people and the whole country (Al-Hammadi et al., 2020). Numerous studies have demonstrated the substantial influence of entrepreneurship on national stability and economic growth(Jena, 2020). In this scene, entrepreneurs play a leading role in economic revitalization (Hassan et al., 2020). They essentially lead businesses, explore different business perspectives, and apply them to foster economic development, thereby accelerating the growth of their country. In addition, entrepreneurs create various skills and commence their business ventures with outstanding achievements (Arora & Agarwal, 2019).

Sustainable entrepreneurship has gained attention in recent years from researchers, business professionals, and policymakers (Sana et al., 2021). It connects the idea of entrepreneurship with environmental and social sustainability goals. In this context, entrepreneurs play a role similar to the market-clearing function described in classical economics. Sustainable entrepreneurship means finding, evaluating, and using opportunities that help support economic growth, reduce social inequality, and protect the environment (Gopal, 2024). The United Nations Sustainable Development Goals (SDGs) also encourage entrepreneurs to include global sustainability targets in their business plans, which supports this approach (Islam et al., 2024).

In fast-changing global circumstances, sustainable entrepreneurship is key in equipping entrepreneurs with resilience and a competitive edge, grounded in the triple bottom line of economic, environmental, and social outcomes (Haque, 2024). Traditional entrepreneurship is based on the core principles of innovation, opportunity recognition, and resource allocation. In contrast, sustainable entrepreneurship integrates economic, environmental, and social considerations into the central planning of business activities. This approach has increasingly become vital to modern business strategy, aiming to balance profit with broader societal and environmental goals. Individuals who launch businesses to address social and environmental challenges through innovative methods and practices are known as sustainable entrepreneurs.

According to the literature, sustainable entrepreneurs significantly influence the socio-economic development of the regions in which they operate. Some motives that help materialize sustainable entrepreneurship are poverty, illiteracy, hunger alleviation, human health advantage, social, economic, legal justice, and environmental sustainability for future generations (Vevere et al., 2021). In developing countries, the growth of sustainable entrepreneurs is likely to foster the economy and tackle social and ecological issues. (Islam et al., 2024). According to case studies, sustainable practices can apply local knowledge to deliver longer-term solutions while helping reduce poverty, unemployment, and environmental degradation. Islam et al. (2024) propose that these areas should have governance, incentives, and enhanced mechanisms for ratings to help with sustainable entrepreneurship.

In Pakistan and Türkiye, sustainable entrepreneurship is gaining popularity. Both countries have emphasized the importance of sustainable entrepreneurship in achieving economic, social, and environmental goals. In Pakistan, it is encouraged through educational programs, entrepreneurial bricolage, and corporate-level planning. In contrast, Türkiye focuses on green entrepreneurship and developing supportive ecosystems. Various factors influence the growth of sustainable entrepreneurship in each country. This discussion will examine those key factors in detail.

Pakistan has introduced educational initiatives that promote entrepreneurship. Research shows that students' intentions toward sustainable entrepreneurship can be positively influenced by environmental values and entrepreneurial education. It is

recommended that more universities offer related courses and establish incubation centers to strengthen these intentions ("Mapping the Path to Sustainable Entrepreneurship: A Survey of Intentions among Public Sector University Students in Pakistan", 2023; Waris et al., 2021). One study in Pakistan also examined the concept of entrepreneurial bricolage, highlighting how entrepreneurs creatively combine available resources to address challenges.

Economic innovation is a mediator in the relationship, showing the importance of being resourceful and innovative for entrepreneurial growth. In Türkiye, the main driver of sustainability is green entrepreneurship. It enhances business sustainability through green structural capital, although environmental conditions influence this effect. A stable environment allows businesses to gain the most from green entrepreneurship (Tekala et al., 2024). Support and cooperation among actors within entrepreneurial clusters make it easier for sustainable entrepreneurship to develop in Türkiye. Ecosystems play a key role in developing sustainable business models that create environmental and social value (Mutlucan, 2022). The success of startups in Türkiye often depends on the support they receive and the barriers they face in pursuing sustainable development. This means that with strong support, they are more likely to overcome challenges. Sustainable orientation is found to be stronger, especially among younger founders.

Pakistan and Türkiye are making considerable efforts to achieve success in sustainable entrepreneurship; however, significant challenges remain. In Pakistan, more efficient policies and larger-scale studies are needed in the field of sustainable entrepreneurship. More strategies to tackle environmental uncertainties and support systems can enable Türkiye's sustainable entrepreneurship. Sharing insights and strategies between both countries could help address common challenges and foster a more robust environment for sustainable entrepreneurship.

Individuals need to assess the environmental status of a country to make a good choice for establishing new ventures (Biswas & Verma, 2021). Thus, identifying the factors that affect sustainable entrepreneurship intentions is very important to enhance sustainable entrepreneurial activity in society. This research study is based on situational factors, namely the economic environment, business ecosystem, and technological support on sustainable entrepreneurial intentions (SEI) and behavior (SEB) of Pakistan and Türkiye university students. The study targets students enrolled

both in private public universities, specifically in Lahore in Pakistan and Istanbul in Türkiye, where higher educational institutions are concentrated (Higher Education Commission, 2022; Turkish Council of Higher Education, 2023).

The economic environment is becoming an increasingly important concern, especially in developing countries where financing sustainable businesses remains a major challenge. Recent research shows that students in Türkiye and Pakistan generally have positive intentions toward sustainable entrepreneurship; however, these intentions often do not result in actual business creation due to economic constraints (Khan et al., 2023; Yıldırım & Özkul, 2023). The business environment in both countries plays a mixed role. While both governments have introduced policies to support green startups, problems remain regarding proper implementation and bureaucratic obstacles (Pakistan Economic Survey, 2023; Turkish Statistical Institute, 2023).

Technological factors present particularly interesting dynamics in these contexts. While Turkish students benefit from relatively advanced technological infrastructure, Pakistani students often face digital divides that hinder sustainable venture creation (Ahmed et al., 2023; Demir & Bayraktar, 2023). This study reveals that these factors have become crucial enablers of sustainable entrepreneurship among youth in both countries (Malik et al., 2023; Arslan & Tekin, 2023).

The choice of Pakistan and Türkiye as research contexts is particularly relevant given their:

1. A growing youth population with high entrepreneurial potential
2. Increasing governmental focus on sustainable development goals
3. Contrasting yet complementary economic and technological landscapes
4. Significant cultural and religious influences shaping entrepreneurial motivations

1.3. Problem Statement

Nowadays, the world is constantly striving for economic growth, sustainable development and improving the quality of life. Sustainable entrepreneurship is an emerging sector that aims to address social and environmental challenges through business-oriented solutions. Sustainable entrepreneurship is an emerging sector that aims to address social and ecological challenges through business-oriented solutions. Sustainable entrepreneurship is an emerging sector that aims to address social and environmental challenges through business-oriented solutions. The problem statement

is that economic growth must be balanced while environmental and social sustainability needs are satisfied. The aim is to develop business models that earn money and positively impact society and the environment. This requires a fundamental shift from linear economic systems toward circular and sustainable models. This requires a fundamental shift from linear economic systems toward circular and sustainable models. It is imperative to make the switch for the protection of the social welfare of people and the long-term viability of both the economy and the planet. The next sections will discuss the main issues related to this problem statement.

Sustainable entrepreneurship seeks to address major issues by combining social, economic and environmental objectives that are very crucial for social welfare sustainability of present and future generations (Jong, 2023). Entrepreneurs should align their businesses with the United Nations Sustainable Development Goals (SDGs), which aim to address global challenges such as poverty alleviation, environmental protection, and social equity (Islam et al., 2024). Circular restaurant design aims to create establishments that prioritize sustainability and environmental responsibility by focusing on minimizing waste and promoting resource efficiency. Business practices must align with the SDGs. In practical terms, this involves developing innovative, eco-friendly business models that minimize environmental harm and promote resource efficiency.

Sustainable entrepreneurship faces limited access to finance along with infrastructure constraints and regulatory reform needs to support sustainability practices (Islam et al., 2024). Despite these challenges, there remains a significant opportunity for sustainable entrepreneurs to harness the power of enterprise to achieve social, environmental and economic growth especially in developing countries. Sustainable entrepreneurship is a relatively recent field which explains why a large amount of literature is conceptual. Researchers are studying sustainable entrepreneurship to gain deeper insights into its dynamics, developments, and outcomes (Rajasekaran, 2013; Aghelie et al., 2016). Creating a detailed theoretical framework and models will advance the field and help implement sustainable business (Binder, 2017; Kazemi et al., 2020).

Sustainable entrepreneurship is often seen as a useful approach to address global challenges, but it has also faced criticism. Some scholars caution against viewing it as a complete solution to all social and environmental problems, especially since its

practical application remains unclear (Sołoducho-Pelc, 2020). To better understand how sustainable entrepreneurship can be applied in real-world settings, further research and empirical investigation are needed. As research in this area grows, it will help highlight the importance of sustainable entrepreneurship within the global ecosystem.

According to the Theory of Planned Behavior, intention is the strongest predictor of any planned action. Individuals are most likely to behave in line with their intentions when deciding to engage in a particular activity (Ajzen, 1985). Therefore, it is important to examine the factors that influence the formation of sustainable entrepreneurial intentions, as this understanding can help promote and increase sustainable entrepreneurial actions within society.

Researchers have identified two main categories of factors that influence the behavior and intentions related to sustainable entrepreneurship. These are broadly divided into internal and external factors. Internal factors include empathy, innovativeness, ethical blindness, self-efficacy, environmental intentions, and demographic characteristics. External factors consist of social norms, perceived obstacles, and current or future incentives. Among these, internal factors play a crucial role in shaping sustainable entrepreneurial intentions. In particular, entrepreneurial education significantly enhances the intention to launch a sustainable business, as it provides individuals with the skills and mindset needed to innovate and address sustainability-related challenges (Zemlyak et al., 2022).

Also, perceived entrepreneurial feasibility, control on behavior, and attitude towards sustainability could help enhance one's intention to participate in sustainable entrepreneurial activities, particularly among students. (Meslem et al., 2024). Some personality traits and subconscious goals matter too these certain traits may foster sustainable entrepreneurial intentions, thanks to subjective motives. To further explain it, social norms regulate behaviors. Sustainability orientation revolves around maximizing resource and product life cycles. Time orientation impacts entrepreneurs' decisions, including succession plans and investment cues.

Government regulations and support systems are critical, as they provide the institutional framework and incentives necessary to foster sustainable entrepreneurship. Additionally, the Theory of Planned Behavior and Entrepreneurial Event Model implicate that attitude, perceived behavioral control or self-efficacy, and

social norms are paramount in formulating sustainable entrepreneurial intention (Usman et al., 2024) (Yasir et al., 2021). The personal values of entrepreneurs (altruistic and biospheric values) also impact these intentions by influencing their attitudes toward sustainability. In conclusion, sustainable entrepreneurship is determined by education, psychology, culture, regulatory, and other factors that shape entrepreneurial intentions and behavior toward sustainable entrepreneurship intentions.

A review of the current literature shows that certain factors have been overlooked, and gaps should be addressed. Research shows that barriers can stop people from becoming entrepreneurs altogether, or they can slow down the process to start up and hamper business success. Sustainable entrepreneurs face challenges in accessing funds, absence of law, shortage of support structures, lack of training programs, etc (Gupta et al., 2020). Researchers have suggested and noted this (Tan et al., 2019). Perceived barriers can arguably affect sustainable entrepreneurial intention. However, further research is required to be conducted in this regard. Hence, understanding the importance of starting a business barrier is essential (Aljuwaiber, 2020), which is largely missing from the current literature (Gupta et al., 2020).

Educational support is key to sustainable entrepreneurial intention (SEI) and sustainable entrepreneurial behavior (SEB). Many studies have found that structured education program on entrepreneurship contribute directly to SEB through competency development on sustainability like green business modeling, circular economy, and eco-innovation (Fayolle & Gailly, 2015; Nabi et al., 2017). Educational institutions can also serve as significant ecosystems that provide access to funding, mentoring, and incubation, all of which enhance the capability to carry out such activities (Lans et al., 2014).

Entrepreneur education utilizes numerous rational methods to promote SEI. Business courses can develop supportive attitudes to create sustainability, strengthen perceived behavioral control (self-efficacy), and enhance subjective norms by establishing networks of peers and mentors who value or support a sustainable venture (Liñán & Fayolle 2015; Kuckertz & Wagner 2010). Programs inspired by the triple-bottom-line framework are especially noteworthy as they significantly increase the willingness of students to engage in entrepreneurial ventures around sustainability (Shepherd & Patzelt, 2011).

Educational support connects a potential student's enrollment decision with their actual attendance. Strong entrepreneurial intentions are necessary but often not enough to create a venture due to a host of implementation roadblocks. Entrepreneurship education can remedy this by enabling individuals to recognize opportunities, evaluate risks, and secure resources (Walter & Block, 2016; Souitaris et al., 2007), strengthening the SEI-SEB relationship. This moderating effect is particularly pronounced in sustainability contexts where additional knowledge and skills are required to navigate the more complex environmental and social challenges.

Scholars are concerned and look towards the future as sustainable entrepreneurial activities are highly influenced by contextual settings, and therefore, it is suggested by them for future research that they need to take different contextual settings into account while examining this field of study (Hakami, 2021). Contextual factors, such as these issues, are critically important in promoting the SEI and SEB. These external conditions enable or hinder individuals from pursuing sustainability-driven ventures by motivating or demotivating them.

Sustainable entrepreneurial intention (SEI) and sustainable entrepreneurial behavior (SEB) are impacted by the economic environment, business ecosystem, and technological infrastructure. The present economic climate affects the choices of entrepreneurs, as experienced businesspeople explain at startup events. The relationship between sustainability-oriented venture creation and the creation of macroeconomic and capital market conditions that favor a new business startup will be further established. On the other hand, volatile economic conditions may restrict entrepreneurial action. But it was recently studied that sustainability-focused ventures are more resilient during downturns (Liguori et al., 2023).

Both institutional and business environments impact equally on sustainable entrepreneurship. According to Hoogendoorn and others (2021), sustainability and environmental policies help entrepreneurs a lot in starting their enterprises. The research conducted by Demirel and Li (2023) indicates that setting up a network of green enterprises leads to the development of sustainable enterprises. Competition turns counterproductive and inhibits traditional entrepreneurs from maximizing their potential. However, they innovate for sustainability to remain at the fore during tough competition (Porter and Kramer, 2019).

Over the years, technological factors have become a significant enabler. The availability of clean technologies and digital platforms for sustainable business operations has significantly lowered barriers to green venture creation (Hockerts & Wüstenhagen, 2022). According to Kshetri (2023), technological factors like renewable energy systems, AI for sustainability analysis, and blockchain for supply chain transparency are altering business models. Yet, the digital gap remains a major problem. The developing economies do not possess the technological infrastructure needed for entrepreneurs to create sustainable ventures (George et al., 2022).

These results align with modern theories on entrepreneurship investigations. Institutional theory provides an explanation of how regulatory and normative pressures shape sustainable business practices (DiMaggio & Powell, 2022), while the dynamic capabilities perspective explains how technological resources can enable sustainable value creation (Teece, 2021). The relationship between these situational factors and individual entrepreneurial traits creates complicated ecosystems whereby sustainable ventures either emerge or fail to emerge.

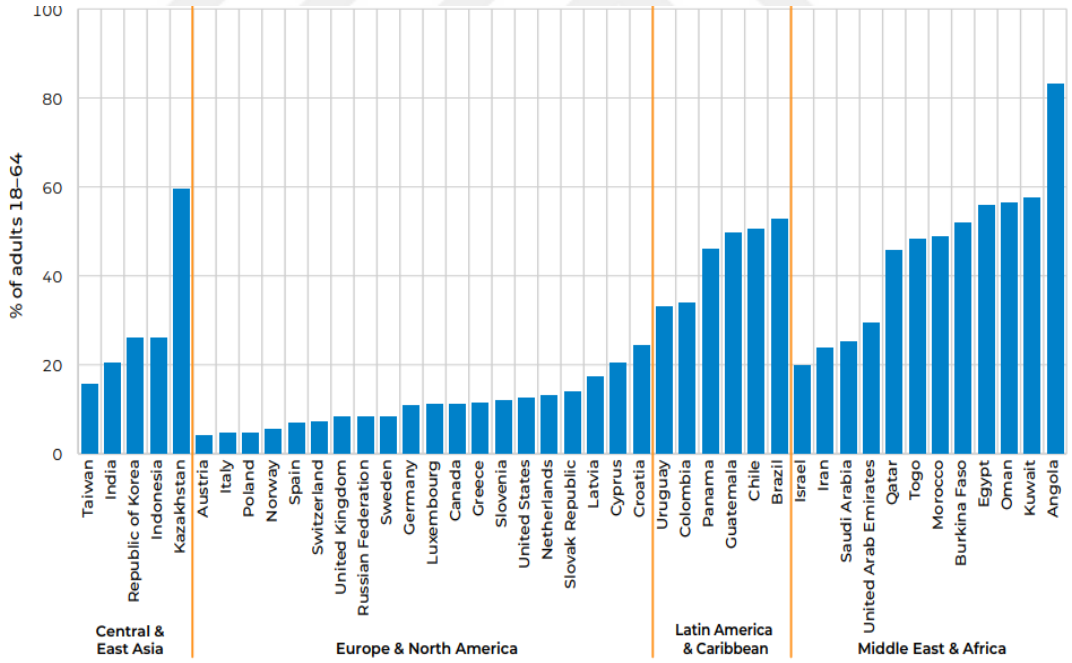


Figure 1.1: The Rate of Adults Intending to Start a Business Within the Next Three Years

Source: Bosma et al., 2021

According to Chaniago and Malik Sayuti, 2022, entrepreneurial intention is the willingness and ability of individuals to create valuable business ideas and the ability

to see opportunities and available resources to realize their dreams. Thus, it is necessary to improve the understanding and knowledge about antecedents of sustainable entrepreneurial behaviors linked with intentions in Pakistan and Türkiye. Accordingly, this study proposes self-efficacy, subject norms, perceived barriers, and attitudes toward sustainable entrepreneurship as antecedents of sustainable entrepreneurial behaviors and intentions. The above-stated research problems and gaps lead to the following research questions and objectives.

1.4. Research Questions

The following research questions emerged after reviewing the relevant literature and finding the gaps:

General Research Question of the Study:

What are the similarities and differences between conventional and Islamic approaches to sustainable entrepreneurship in the SME sector? How do these frameworks influence entrepreneurial intentions and behaviors as well as sustainability outcomes?

Specific Research Questions based on the PLS-SEM Model:

1. What is the effect of entrepreneurial subject norms on sustainable entrepreneurial behavior?
2. How does self-efficacy influence sustainable entrepreneurial behavior?
3. What's the effect of entrepreneurial subject norms on sustainable entrepreneurial behavior?
4. How do perceived obstacles impact eco-friendly entrepreneurial conduct?
5. What is the direct effect of intention towards entrepreneurship on behavior that promotes entrepreneurial sustainability?
6. How the intention of an entrepreneur influences an entrepreneurial attitude
7. What effect does self-efficacy have on sustainable entrepreneurial intentions?
8. How do social norms related to entrepreneurship affect this intention?
9. What is the effect of perceived hurdles on sustainable entrepreneurial intentions?
10. Does business learning affect sustainable entrepreneurship?
11. How do situational forces affect entrepreneurial behavior of sustainability?

12. Does the intention of sustainable entrepreneurship impact the attitude to entrepreneurship and the behavior of sustainable entrepreneurship?
13. Does the intention to take sustainable entrepreneurial actions mediate the effect of self-efficacy and action challenges?
14. Does sustainable entrepreneurial intention mediate the relationship between subject entrepreneurial norms and sustainable entrepreneurial behavior?
15. Does sustainable entrepreneurial intention act as a mediator between the perception of barriers and sustainable entrepreneurial behavior?
16. Does a person's sustainable entrepreneurial intention relate to their sustainable entrepreneurial behavior and does this relationship get moderated by entrepreneurial education?
17. Do environmental circumstances have an influence on intentions and actions restricting eco-friendly entrepreneurial activity?

1.3. Research Objectives

The following research objectives are formed based on the above-mentioned research questions:

RO1: Examine the effect of entrepreneurial attitude on sustainable behavior.

RO2: Investigate the influence of self-efficacy on sustainable behavior.

RO3: Assess the impact of subject norms on sustainable behavior.

RO4: Analyze the effect of perceived barriers on sustainable behavior.

RO5: Determine the effect of entrepreneurial intention on sustainable behavior.

RO6: Explore the influence of attitude on entrepreneurial intention.

RO7: Evaluate the effect of self-efficacy on entrepreneurial intention.

RO8: Investigate the impact of subject norms on entrepreneurial intention.

RO9: Analyze the effect of perceived barriers on entrepreneurial intentions.

RO10: Examine the influence of education on sustainable behavior.

RO11: Assess the effect of situational factors on sustainable behavior.

RO12A: Determine if intention mediates the attitude-behavior relationship.

RO12B: Evaluate if intention mediates the self-efficacy-behavior relationship.

RO12C: Investigate if intention mediates the norms-behavior relationship.

RO12D: Analyze if intention mediates the barrier-behavior relationship.

RO13: Assess if education moderates the intention-behavior relationship.

RO14: Evaluate if situational factors moderate the intention-behavior relationship.

1.4. Research Scope

This study will apply the theory of planned behavior (TPB) paradigm to study the elements of attitudes, subjective norms, perceived behavioral control, and intents specifically. By looking at them both (Türkiye and Pakistan), we can easily compare both. The two countries were chosen due to their distinctive economic, social, and cultural settings, which offer different views on sustainable entrepreneurship and micro-financing. It is important to note the study's limitations, which are sample size limitations, generalizability, and self-reported data bias. The study's result will inform on the role of situational factors and education support in motivating sustainable entrepreneurship practices in SMEs through the TPB constructs. The research's practical implications will support the creation of plans and actions to encourage environmentally friendly business practices via microfinance.

The recommendations and findings will help Pakistan and Türkiye in achieving the Sustainable Development Goals (SDGs) by promoting sustainability development, improving the integration of sustainable entrepreneurship with SMEs, etc.

This study investigates the determinants of sustainable entrepreneurial behavior (SE Behavior) among entrepreneurs and aspiring entrepreneurs, with a focus on both psychological and contextual factors. Sustainable entrepreneurial behavior is the dependent variable. The independent variables include entrepreneurial attitude (ENT-Att), self-efficacy (Self-Efy), entrepreneurial subjective norms (EntSNorm), perceived barriers (PBarrier), entrepreneurial education (Ent-Education), and situational factors (SituFactors). Also, this study investigates sustainable entrepreneurial intention (SE Intention) mediating the impact of the key antecedents (ENT-Att, Self-Efy, EntSNorm, and PBarrier) on SE Behavior. It is also worth mentioning the concept of perceived barriers (PBarrier). It is a multidimensional construction that refers to, amongst others, the financial, regulatory, market, resource, and sociocultural obstacles. The study

investigates whether entrepreneurial education (Ent-Education) and situational factors (SituFactors) moderate the relationship between SE Intention and SE Behavior.

Through a combination of these variables, the study aims to obtain a complete understanding of factors that drive and inhibit sustainable entrepreneurial actions. A quantitative approach was used to achieve the research objectives, and a questionnaire was distributed among university students in one public and private universities located in both Türkiye and Pakistan. The university is an establishment where students pass on to the next stage of operating life. Right after graduation, students decide how to go forward with their life (Chengalvala & Rentala, 2017). With a high probability, business management students establish their own businesses and have the potential to be sustainable entrepreneurs after graduation. The suitable sample size for this study is 400, as explained in Chapter 6.

Regarding geographical concentration, this study will only focus on universities in Istanbul and Lahore because these two cities are considered hubs of education with the highest percentage of universities. Therefore, by targeting business management students who are studying in Istanbul and Lahore, the sample can be a suitable representative of the population. Distribution of universities in various provinces.

1.5. Significance of Study

This study is significant from a theoretical and practical perspective. The findings of this study will provide insights into the formation of sustainable entrepreneurial behaviors by identifying the factors that may encourage or discourage university students from being or not to be entrepreneurs in the future. Such investigation may allow both researchers and educators to gain a good understanding of the determinants of sustainable entrepreneurial intentions, which ultimately contribute to higher rates of sustainable entrepreneurial behavior in society.

Theoretically, the findings of this study will bridge the gaps in the literature by focusing on less investigated areas. For instance, the literature highlights that barriers have an adverse impact on sustainable entrepreneurial activities (Cheraghi et al., 2019; Sana et al., 2021; Vevere et al., 2021); however, the barriers faced by the students of different disciplines are not well understood (B. Hussain et al., 2022), particularly in the context of developing countries. More studies should be carried out in developing nations as most of previous studies are conducted in developed countries. This would

highlight specific challenges coming from socio-cultural differences, domestic competitors, and underdeveloped institutional frameworks in developing countries (Gupta et al., 2020).

Another significant feature is that this study's examination of situational factors holds substantial significance for both theoretical advancement and practical application in the field of sustainable entrepreneurship. The economic environment, institutional framework, and technological infrastructure collectively serve as powerful determinants that can either enable or constrain students' transition from entrepreneurial intentions to concrete actions. In developing economies like Pakistan and Türkiye, these external conditions frequently outweigh individual motivations in predicting venture creation success (Khan et al., 2023). Our findings will provide critical insights into the specific barriers and enablers that most significantly influence sustainable business formation in these distinct yet comparable contexts.

Next are the practical implications that will benefit the government, policymakers, practitioners, ministry of higher education, universities, and students. One implication of the study is that the government can encourage university students to develop a sustainable enterprise on promoting sustainable entrepreneurship in various digital platforms and paving the road for students to establish sustainable ventures. With more and more people becoming self-employed, the unemployment rate will decrease, and social value will be created, which benefits society and uplifts the quality of life. The findings of this research will also help the Ministry of Higher Education and universities Pakistan and Türkiye to encourage and organize more sustainable entrepreneurial activities among students in developing and producing more graduates who have positive attitudes to become sustainable entrepreneurs. Furthermore, this research can also benefit the students by opening their eyes and mindset about enabling barriers to become sustainable entrepreneurs while they have any idea about contributing to society. With a better understanding of barriers to sustainable entrepreneurship, they can be more determined to work hard to overcome barriers and become successful sustainable entrepreneurs.

1.6. Terminological Definitions

The operational definitions of the key terms and research variables are presented below.

1.6.1. Sustainable Entrepreneurship

Sustainable entrepreneurship is the act of searching, evaluating, and embracing opportunities that create wealth that fosters economic prosperity, social cohesion, and environmental protection. (Gopal, 2024). It focuses on the long-term impacts of business decisions on society and the environment and seeks to earn profit without harming people and nature (Imamah & Nafisa, 2023). The idea is based on the sustainable development goals' incorporation into entrepreneurial pursuits, linking them with the purpose of achieving wealth and success while ensuring sustainability (Kazemi et al., 2020).

1.6.2. Sustainable Entrepreneurship Behavior

Sustainable entrepreneurship behavior refers to a multifaceted concept that combines entrepreneurial activities with sustainable principles, which include economic, social, and environmental dimensions. According to Yang et al. (2022), sustainable entrepreneurial behavior is affected by entrepreneurial intention, risk perception and the institutional environment, with risk perception acting as a mediator. Education and incorporation of sustainability values are important for sustainable entrepreneurial behavior right from the moment business ideas are formed (Parra, 2013).

1.6.3. Sustainable entrepreneurial Intention

Intention refers to a state in someone's mind, which constitutes their interest in accomplishing their goals. Entrepreneurial intention can be defined as the interest to starting a high growth business (Derdar & Moulai, 2022), Sustainable entrepreneurial aim (SEI) means an entrepreneur's intention to create and develop ventures that create economic wealth while solving social and environmental challenges. This idea considers the economy, environment and society's triple bottom line and aims for balancing. The term sustainable entrepreneurial intention in this study implies the degree of commitment and interest of students to establish a social venture in near future.

1.6.4. Perceived Barriers

The perceived barriers can be defined as the extent to which individuals perceive challenges in the initiation of sustainable entrepreneurship (Shaverdi et al., 2018). Several factors restrain the development of social enterprises, which is seen from literature (Mehtap et al., 2017; El Haloui et al., 2019; Ataei et al., 2020; Vevere, 2021).

The perceived barrier in this research refers to a many-dimensional phenomenon that focuses on the factors that restrict sustainable entrepreneurship of students. The dimensions of perceived barriers refer to an absence of awareness, absence of know-how, absence of financing, absence of backing and absence of upskilling.

1.6.5. Entrepreneurial Education

The process for Students' Entrepreneurial Education for sustainable entrepreneurial intention involves enhancing skills, knowledge and attitudes towards sustainable entrepreneurship. This support is necessary to ensure the development of sustainable startups that align with Sustainable Development Goals (SDG). Various studies have explored different educational strategies and their impact on students' intentions to engage in sustainable entrepreneurship.

1.6.6. Attitudes toward Sustainable Entrepreneurship

Attitudes represent the habitual reactions to events. The expression of an attitude is usually restricted to a view that indicates the overall tendency of an individual towards the object, belief or entity. Attitudes may be favorable, negative or neutral, as well as generic and neutral (Sawangchai et al., 2022). In this study, attitude toward Sustainable entrepreneurship refers to the degree in which students have negative or positive evaluation about sustainable entrepreneurship as a future career.

1.6.7. Subjective Norm

Subjective norm refers to the extent to which individuals feel that they can tap into support networks (Hockerts, 2015). In the context of this study, subjective norms can be defined as respondents perceived pressure from informal networks such as family, friends and lecturers to show ssustainable entrepreneurial behavior.

1.6.8. Entrepreneurial Self-Efficacy

In the context of sustainable entrepreneurship, self-efficacy refers to an individual's belief that he can contribute towards Sustainable problems(Ghatak et al., 2020). In this study, entrepreneurial self-efficacy refers to the degree in which individuals believe in their own skills and capabilities to become a Sustainable entrepreneur.

1.6.9. Situational Factors

Situational factors in this study

refer to the external environmental conditions that directly or indirectly influence the formation of sustainable entrepreneurial intentions (SEI) and the translation of these intentions into actual sustainable entrepreneurial behavior (SEB) among university students in Pakistan and Türkiye. These factors represent the broader ecosystem in which potential entrepreneurs operate, encompassing economic, institutional, and technological dimensions that can either facilitate or constrain sustainable venture creation (Urban & Kujinga, 2017).

1.6.9.1. Economic Environment:

This dimension captures the macroeconomic conditions and financial infrastructure that affect entrepreneurial activities. It includes Availability of sustainable business financing (green loans, impact investments), Market demand for eco-friendly products and services and Economic stability indicators (inflation rates, currency fluctuations), Unemployment levels and youth employment policies. Recent studies in developing economies highlight how economic volatility significantly impacts students' entrepreneurial intentions, with sustainable ventures being particularly sensitive to funding accessibility (Khan et al., 2023; Yıldırım & Özkul, 2023).

1.6.9.2.Business Environment

This component examines the formal and informal institutional support systems Government policies promoting sustainable entrepreneurship like as Regulatory framework and bureaucratic procedures, Presence of business incubators and mentorship programs and University-industry collaboration mechanisms. Research demonstrates that institutional support is crucial for bridging the intention-behavior gap in sustainable entrepreneurship, particularly in emerging markets (Hoogendoorn et al., 2021).

1.6.9.3.Technological support:

This dimension assesses the digital and technological infrastructure like Availability of green technologies and clean energy solutions, Digital platforms for sustainable business operations, social media as a tool for eco-conscious marketing, Technological literacy and digital skills among students. Studies in both Pakistan and Türkiye emphasize the growing role of digital technologies in enabling sustainable startups, while also noting persistent digital divides in certain regions (Ahmed et al., 2023; Demir & Bayraktar, 2023).

1.7.Structure of the Study

This study is organized into three chapters. Chapter 1 focuses on the explanation of the research background and statement of the research problem. Additionally, the research questions and objectives are presented in this chapter followed by defining the key research variables. Chapter 2 is allocated to describing the extant literature and underpinning theories. Then, identified variables and hypothesized relationships are presented. The last part of chapter 2 focusses on elaboration of the proposed conceptual framework. The chapter ends with a summary. Chapter 3 is mainly concerned with explaining the research methodology that is suitable for this study. To this end, first the research paradigm, design and method is explained. Next, the scales that are adopted to measure the variables are presented. Then, the data analysis method is explained.

CHAPTER II
LITERATURE REVIEW

2.1. Introduction

This chapter reviews the extant literature on entrepreneurship, sustainable entrepreneurship. Literature review revealed some gaps that led to developing a new conceptual framework. Literature summaries and key findings. Underpinning theories include theory of planned behavior, theory of sustainable entrepreneurship behavior and agenda setting theory.

2.2. The Evolution of Term Entrepreneurship

The idea of entrepreneurship has changed dramatically through time as economic, social and technological developments have progressed. Entrepreneurship started as a word to describe the undertaker of a project. Then, this word means the maker of the innovation which can bring forth growth in the economy. The article will discuss how this word and its meaning change with time.

2.2.1. Early Concepts: The Middle Ages to the 18th Century

The term “entrepreneur” is a French word that means “to undertake”. In Medieval and Renaissance times, a person who “undertook” to manage a large-scale production – most of the time engineering or military – was called an entrepreneur. These were not innovators in the modern sense, but they took a lot of risks to undertake complex projects. They usually require royal endorsement or aristocratic support as execution work rather than an idea. (Cantillon, 1755; Hébert and link, 1988).

The 18th century was when the modern idea of entrepreneurship started to take shape. Richard Cantillon, a French Irish economist, is usually considered to have formalized the role of the entrepreneur within economics. In his book Essai sur la Nature du Commerce en Général (1755), Cantillon gives the definition of an entrepreneur as a risk-taker buying at the known price and selling at the unknown price. This idea placed the entrepreneur's role at the heart of the market functioning issue. The ideas of Cantillon were the seeds of classical and neoclassical economics. (Cantillon, 1755).

2.2.2. Coordinators and Value Creators of 19th Century

Say was an important French economist who expanded on Cantillon's ideas in the 19th-century. According to Say, entrepreneurs manage and coordinate their resources instead of just taking risks. They help in shifting resources from low productive areas to high productive areas to bring economic value to the economy. Say believed that entrepreneurs were not just risk-takers who created new things. These entrepreneurs would take resources from low productivity areas and convert them into high productivity. (Say, 1803; Schumpeter, 1934).

2.2.3. The 20th Century has seen Major Innovators and Change Agents.

In the 20th century, Joseph Schumpeter addressed the topic of entrepreneurship. Similarly, the concept of entrepreneurship was further defined by 20th century thinkers. According to his 1934 book The Theory of Economic Development, the entrepreneurs were innovators who focused on development, in fact, he mentioned that entrepreneurs were in the business of "creative destruction" that means disrupting the market and people by installing something new through a new product, new process or new method of doing business. Schumpeter believed that the most important characteristic of an entrepreneur is innovation and not risk-taking and coordination. (Schumpeter, 1934).

Entrepreneurship began to be seen as a vital source of economic growth during this period. It was associated with industrialization, modernity, and growth markets. Schumpeter's thinking focused on innovation rather than taking risk and coordination. During this Period, entrepreneurship was seen as an important instrument of economic growth. (Knight, 1921; Kirzner, 1973).

2.2.4. Happening After the Cold War to Globalization of 20th Century

The world of entrepreneurship was quite different in the late 20th, early 21st century than before. The rise of digital technologies and the internet in the late 20th and early 21st century revolutionized the way businesses operate. This time also saw the emergence of sustainable entrepreneurship which mixes profit-making and success. Grameen bank's Muhammad Yunus was a social entrepreneur who was able to solve social problems with new techniques. (Yunus, 1999; Dees, 1998).

From that era, the governments and academic institutes also recognized entrepreneurship as a key driving force of innovation and employment. Numerous

programs to develop ecosystems, incubators, and accelerators were introduced to encourage a startup-oriented approach in a competitive global economy. (Audretsch, 2007).

2.2.5. Contemporary Understanding of Entrepreneurship

At present entrepreneurship is a diversified concept pertaining to economic, social, and technological. Entrepreneurs act as drivers of economic growth, create jobs and solve challenging problems with innovative ideas and approaches. Entrepreneurs adding environmentally friendly and ethically responsible practices have gained importance because of the latest addition of sustainable and ethical considerations.

With the focus on entrepreneurship education and digital transformation further development, entrepreneurship is being perceived as a mindset across disciplines. The use of crowdfunding and blockchain platforms has further democratized entrepreneurship, making it easier for individuals to start their own ventures. (Giones & Brem, 2017).

The process of entrepreneurship has evolved throughout history, which reflects several economic, technological, and other changes. Entrepreneurs have always helped shape societies and economies, with project managers who are risk-takers on one end and disruptors who innovate on the other end. Entering the 21st century, entrepreneurs are setting high excitement levels for their concepts. In a rapidly evolving world, it is vital to stay updated and not miss out.

2.3. Entrepreneurship to Sustainable Entrepreneurship

Entrepreneurship is a broad concept with several sub-categories, including entrepreneurship (Morrison, 2006). Therefore, before moving to sustainable entrepreneurship, it is necessary to briefly review entrepreneurship as an umbrella term, to gain an overall understanding about it. Fundamentally, entrepreneurship is seen as a vital element to level competition in a competitive market environment and enhance economic well-being for nations (Anwar & Abdullah, 2021). Entrepreneurship is the dynamic method of making progressive wealth by establishing and running profitable businesses. Entrepreneurship raises employment opportunities, improves quality of living, and increases productivity in any country (Chengalvala & Rentala, 2017).

Scholars have defined entrepreneurship from different perspectives. As maintained by (Shan and Venkatarama, 2000), entrepreneurship scholarly examines how, by whom, and with what impacts the opportunities for the creation of future products/services are explored, assessed, and exploited. In another study, entrepreneurship was described by (Derdar and Moulai, 2022)as the exploitation of new opportunities for the provision of novel products/services, organization methods, markets, operations, and raw materials through aligning the efforts that have not existed formerly. In simple words, entrepreneurship refers to conducting or producing something creatively in a way to provide benefits for others and add new value to the products/services(Dewi et al., 2021).

Recently, sustainable entrepreneurship has gained considerable attention among scholars and practitioners, which raises some questions in mind. Sustainable entrepreneurship combines the link between traditional entrepreneurship and sustainable environmental and social problems. This strategy combines the conventional economic functions of entrepreneurs, described by theorists such as Schumpeter and Say, with contemporary concerns regarding ecological as well as social justice. A sustainable entrepreneur integrates society and planet into their business model, not just profit. They are different from a traditional entrepreneur who incorporates just profit into their business model. This evolution shows how business activities worldwide are becoming more sustainable, such as recycling waste and effluents within operations.

The phrase “sustainable entrepreneurship” started appearing in academic literature since the early 1990s. A monumental work that contributed to the discourse was Bennett’s Ecopreneuring: The Complete Guide to Small Business Opportunities from the Environmental Revolution (1991). The work explored the intersection of entrepreneurship with environmentally responsible behavior. (Bouncken 2014) literature review on the evolution of sustainable entrepreneurship can help one grapple with the evolution of research in sustainable entrepreneurship. These foundational works highlight the early recognition of the importance of integrating sustainability into entrepreneurial endeavors, setting the stage for the continued development of the field in subsequent decades.

2.4. Emergence of Sustainable Entrepreneurship

Sustainable entrepreneurship has witnessed a significant growth in research studies since 2014. As we can see the Figure 2.1 below, the prior years of 2005 to 2013 received scant attention, while post-2015, the field began to witness significant growth. There seems to be a sudden increase in literature after 2016 and soon it peaked at 97 in 2024. The growth showcases the global level awareness of sustainability and how important entrepreneurship is to drive innovative responsible business solutions. The trend line in the chart shows a steady and ever-increasing academic interest in the sustainability of entrepreneurship.

Sustainable entrepreneurship is coming into being due to the interaction of digital, ecological and socio-economic factors. A major driving force highlighted by the Ukrainian experience is digital competence. Digital skills and innovations are cogent factors for the success of sustainable entrepreneurship. We can see further confirmation of digital competence as a driving force behind sustainable entrepreneurship in the role played by digital technology in facilitating sustainable technology entrepreneurship and green innovation that are necessary for environmental resilience and sustainability through digital transformation and circular business models (Ali et al., 2024). In Indonesia, the development of sustainable technopreneurs is driven by factors such as personal, social, and environment (Pratama, 2023). Sustainable entrepreneurship has the potential to create economic solutions to social and ecological problems, thereby addressing grand societal challenges at least theoretically.

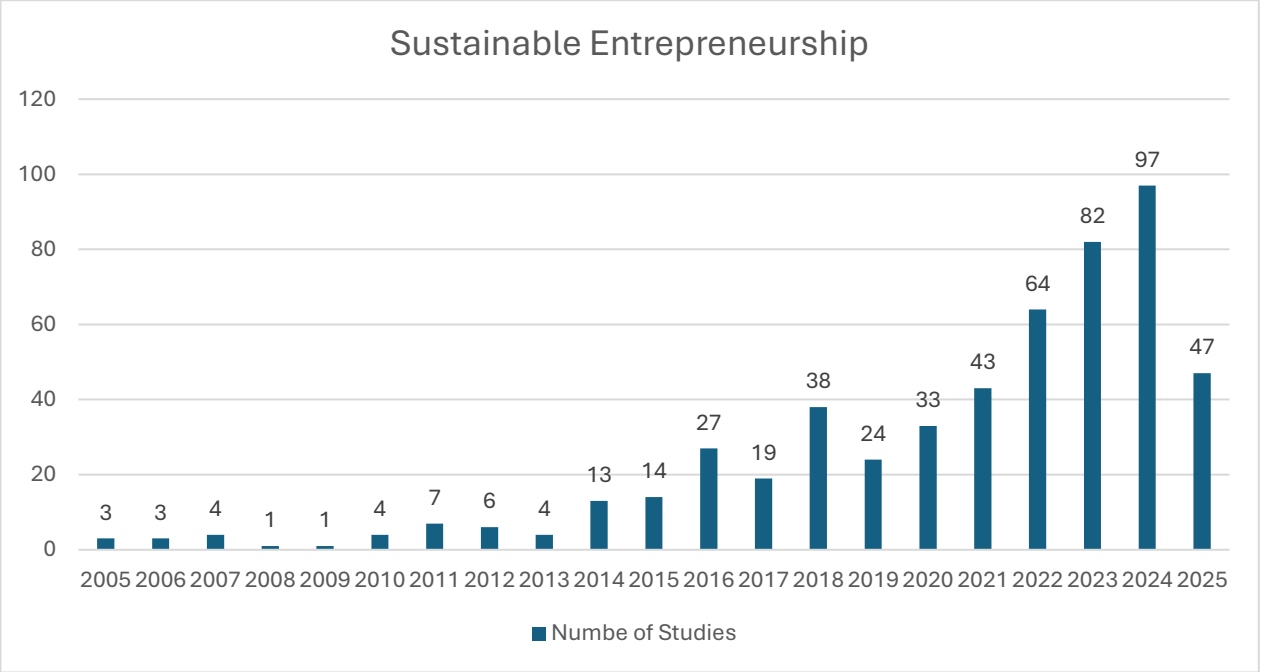


Figure 2.1: Sustainable Entrepreneurship Studies Emergence

Source: Scopus Data Base, 2025

Ecopreneurs, or sustainable entrepreneurs, are primarily motivated by ecological needs; their entrepreneurial vision is also primarily environmentally focused and not necessarily profit-focused (Schlange, 2005). Eco-effective practice of green business is also a way of business setup that gives positive environmental impact which is through acknowledgement of values of natural resources and its efficiency, using circular economy and eco-innovation. In the same vein, sustainability-oriented corporate entrepreneurship, whose antecedents pertain to organization's structure and management and level of support, are strong drivers of sustainability in large firms (Ming, 2019). Low-carbon economy approaches, and eco-innovation as required enabling tools for sustainable entrepreneurship, along with circular economy system that could enhance environmental health and mitigate harmful impact to the environment. In the end, green entrepreneurship can drive sustainable economic growth, which refers to applying eco-innovation in business for business opportunity and social acceptance with new business models and technologies for green development. Combining everything together, these factors indicate the complexity of permanent entrepreneurship, which works with the help of digital innovations, ecology and socio-economy.

2.5. Sustainable Entrepreneurship in Global Perspective

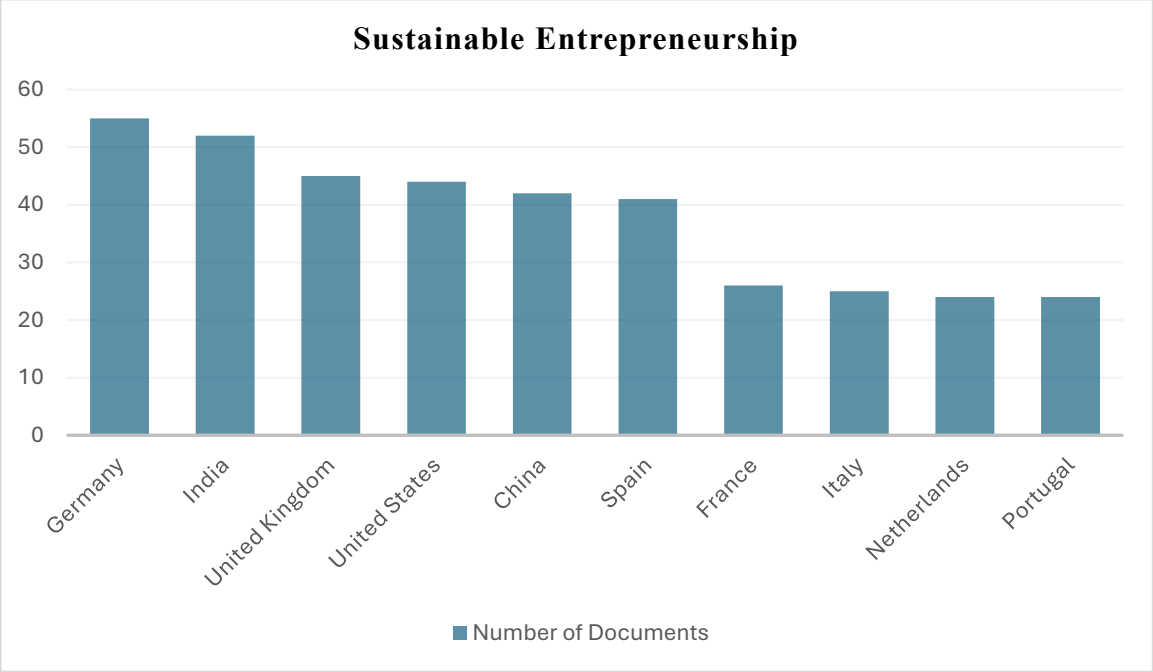


Figure 2.2: Sustainable Entrepreneurship Studies Emergence by country

Source: Scopus Data Base, 2025

As we can see from Figure 2.2 The world of sustainable entrepreneurship displays interesting diversities due to the economy, policy and culture of different regions. With the limitation of the tittle of the studies we can see the Germany leads with 55 studies. It has long been a leader in environmental innovation. As a result of strict regulations, the presence of supportive institutions and a conducive environment for green businesses. The country's aim to integrate technology with social development could serve as a model for sustainable industrial transformation.

Emerging economic powers have different journeys in sustainable entrepreneurship. India had 52 studies that show excellent progress towards the grassroots level of sustainability in renewable design, circular economy solutions, etc. But implementation often suffers from scaling and standardization issues. China's 42 studies indicate a top-down movement, with the government injecting huge funds into clean technologies and infrastructure, leading to rapid changes across sectors.

In the UK (45 studies) and USA (44 studies), sustainable entrepreneurship relies on innovation and ESG investment strategies. Both countries have witnessed growth in green start-ups and corporate sustainability programs, backed by solid academic and

financial ecosystems. On the other hand, the study of Spain (41 studies), and Portugal (24 studies) focuses on sustainable tourism and renewable energy.

France and the Netherlands have 26 and 24 studies respectively, where policy: regulatory compliance, sustainable urban development, com ecofriendly business practices. Countries like Malaysia (20 studies) and South Africa (11 studies) are working on sustainable development. However, emerging economies like these 2 often suffer from the funding and tech gap.

Countries such as Japan (1 study) and Canada (6 studies) are notably less represented in the research, despite being advanced, which may be due to mature yet less-documented sustainability framework or gaps in focus. Meanwhile, Africa and Latin America do not feature heavily on the list, suggesting that they may be regions with substantial potential for future research and action on sustainable entrepreneurship. Researchers from developed nations have multiple papers whereas those from poorer nations have few papers.

2.6. Factors Driving Sustainable Entrepreneurship

Sustainable entrepreneurship is a groundbreaking and ethical business management approach to sustainable long-term strategy that integrates environmental and social objectives into business practices. Here is an enlarged clarification of the main forces that drive sustainable entrepreneurship and academic references.

2.6.1. Environmental Awareness

Sustainability entrepreneurs are conscious of environmental challenges like climate change, pollution, and resource depletion. They reduce carbon footprints, save up energy and manage waste through their businesses. Many sustainable entrepreneurs are already focusing on the circular economy, where resources are reused and recycled rather than disposed of. A business like Patagonia uses recycled materials in their goods and promotes repair and reuse (Bocken et al., 2014). Awareness of the environment helps entrepreneurs to bring about change in society (Hall et al., 2010)

2.6.2. Innovation

Sustainable entrepreneurship relies on innovation for success. Entrepreneurs come up with new technologies and products and make new processes that solve problems and work better. A sustainable entrepreneur uses technology like renewable energy, green

manufacturing, and AI-based solutions to cut down on their ecological footprint (Hockerts & Wüstenhagen 2010). Firms like Tesla made electric cars to show that doing something better for the environment can be profitable too (Schaltegger & Wagner, 2011).

2.6.3. Stakeholder Engagement

Business operations must align with the interest of society and environment. Sustainable entrepreneurs work with customers, employees, suppliers, communities, and other stakeholders so that their practices resonate. Getting stakeholders involved with the decision-making process that can boost trust and innovation, along with ensuring alignment with sustainability objectives, (Freeman et al., 2004). A businessman/sustainer like Yunus works with the help of the community. Grameen bank is a perfect example, where it involved an impoverished community in banking activities. This has greatly helped the community economically and thus socially as well.

2.6.4. Financial Viability

Sustainable ventures must be financially viable to achieve sustainability. Entrepreneurs offset the greater costs of using sustainable practices with long-run economic benefits, such as efficiency gains, brand loyalty, and green funding. Green financing is when venture owners use financial instruments like green bonds, impact investing and governmental grants to finance their sustainable innovations (Cohen & Winn, 2007). Sustainable companies can perform better than non-sustainable companies during economic depression, due to focus on long-term value creation (Lüdeke-Freund, 2020) who studied them.

2.6.5. Regulatory Compliance.

When firms obey the law, they can also lead their industry in sustainable practices. Complying with environmental regulations means meeting the appropriate legal standards set for industry. Minimizing environmental risk through proactive regulation enforcement anticipations can give entrepreneurs a competitive advantage (Kuckertz & Wagner, 2010). Sustainable practices brought about by regulations such as the Paris Agreement can lead to the eco-friendly entrepreneur becoming a market leader.

2.6.6. Social Responsibility.

What is the significance of social Responsibility in our life? Eco-friendly entrepreneurs tend to advocate for decent wages, safety at workplace and gender equality (Shepherd and Patzelt, 2011) "The 3rd principle of CSR states that companies should contribute to the communities in which they operate. For instance, Unilever has several community infusion schemes that enhance education, health and employment."

2.6.7. Long-Term Perspective.

Entrepreneurship that balances immediate profits with future societal and environmental consequences is a strategic outlook. Sustainable entrepreneurship ensures that entrepreneurs preserve resources for the future generations (Schaltegger & Wagner, 2011). Sustainable entrepreneurs maintain a long-term view to anticipate and adapt to future developments instead of only satisfying customers from the present day (Hockerts & Wüstenhagen, 2010).

2.7. Sustainable Entrepreneurship in Small and Medium Enterprises (SMEs):

Small and medium-sized enterprises (SMEs) can use sustainable entrepreneurship which is about creating economic, social and environmental value – the triple-bottom-line approach. Achieving SDGs and confronting global issues such as environmental degradation and social inequality are increasingly recognized as essential. SMEs, which are the backbone of many economies including that of Malaysia and Indonesia, are key in this transition as they contribute significantly to GDP and employment (Sustainable entrepreneurship in Malaysian companies, 2023; Reniati & Faisal, 2024). Nonetheless, implementation of sustainable entrepreneurship in SMEs is not as straightforward due to several obstacles, which include being able to balance profitability, limited participation in sustainability management, and lack of disclosure of environmental information.

To overcome these barriers, institutional support and knowledge management are essential for better integrated organization and sustainability (Akinlotu & Cavlan, 2023). In addition, integrating strategies for innovation and digitalization can help the SMEs in adopting a long-term sustainability agenda though many of the entrepreneurs are still reluctant to take on a pro-growth agenda (Avelar et al., 2024). According to empirical studies regarding Malaysia and Indonesia, factors such as perceived desirability and feasibility, as well as environmental awareness and the like can help

proffer sustainable entrepreneurship among SMEs (Fong et al., 2022) (Tunjungsari et al., 2021).

In addition, adopting circular supply chains, such as those for textiles, offers an opportunity for SMEs to enhance the environment through stakeholder cooperation and innovative pressure development (Istiyani et al, 2024). By aligning their business practices with the SDGs, SMEs can use this to mitigate any major issues facing the globe today to become more resilient and sustainable. In short, it's the joint action of entrepreneurs, policymakers, and institutions to create an enabling environment that supports the adoption of sustainable business models and practices(Nordin & Koe, 2024) (Moiceanu & Anghel, 2024).

2.8. Sustainable Entrepreneurship for SMEs in Türkiye and Pakistan:

Türkiye's sustainable entrepreneurship is a unique area affected by innovation, climate change, and policies, among other things. The entrepreneurial scene in Türkiye has received a boost due to the country's young and educated population's increasing digital literacy, which improves the innovation environment for entrepreneurs. Green entrepreneurship is important and helps in creating sustainable businesses that are environmentally friendly. This is particularly visible in SMEs where green structural capital is a vital mediating factor, but the overall environmental dynamism can moderate the overall effect. Perceived support positively affects the sustainable orientation of Turkish startups and helps the founders overcome barriers (Eroglu & Rashid, 2022).

The 4S model, comprising economic, environmental, technological, and social factors, emphasizes the importance of sustainable entrepreneurship in improving firms' competitiveness and social responsibility (Yilmazer & Onay, 2019). Although it is a wonderful opportunity yet in Türkiye, sustainable entrepreneurship is not greatly studied and clusters are suggested as possible ecosystems for growth. Small and medium-sized enterprises (SMEs) are important because they create a large part of jobs, and they are important in adopting sustainability even if they face issues such as the limitation of resources and following rules and regulations. In addition, Türkiye's entrepreneurship activities have a significant positive influence on environmental quality while renewable energy policies moderate its effects on the ecological footprint "Triangular nexus among entrepreneur, energy policy and economic policy uncertainties: A symmetric and asymmetric evidence of inclusive sustainable

development goal (SDGs)", 2022)(Philip et al., 2021) Türkiye has been an environmentally sustainable country while being an important factor in sustainable development with entrepreneurship. This high potential should be supported and encouraged with developing innovative policies and sustainable development frameworks (Sirakaya & Aslanlar, 2024) (Bağış et al., 2023).

Similarly, there are many factors like education, personal values, socio-economic conditions, among others. Which Influence Sustainable Entrepreneurship in Pakistan? A study revealed that the intentions of Pakistani students towards entrepreneurship are formed through values regarding the environment, and entrepreneurship education. These build sustainable entrepreneurial intentions of students through TPB model. Mapping Out the Path to Sustainable Entrepreneurship Surveying Public Sector University Students of Pakistan's Intentions in the Area 2023". The entrepreneurial community is promoted through entrepreneurial bricolage and frugal innovation in conjunction with sustainable entrepreneurship. (Imran & Iqbal, 2024) According to researchers (Crisan et al., 2021), entrepreneurial behaviors as well as the sustainability of an entrepreneur represent two fast-growing interdisciplinary research domains.

The theme of research is gaining momentum around the impact (or absence) of sustainability orientation and entrepreneurial knowledge in SMEs on sustainable entrepreneurship. The use of social media influences an entrepreneur's intention to be sustainable and attitude towards it. The young entrepreneurs consider the green practices, green MS, and propensity of market to commercialize sustainability that can help environmental entrepreneurship (Soomro et al., 2021). Moreover, it reveals that the factors associated with nature, business and human behaviour positively and significantly affect entrepreneurial sustainability (Abdelwahed et al., 2022).

Individual and systemic standards are crucial for the formation of sustainable entrepreneurial intentions. Many university students are interested in sustainable entrepreneurship. The Theory of Planned Behavior has proven to be effective in predicting sustainable entrepreneurship intention in university students, while sustainability education and self-efficacy are important enablers (Waris et al., 2021). The financial problems, legal troubles, trust issues and others require special interventions to establish a conducive environment for sustainable entrepreneurship. To wrap it up, Students' perceptions of corporate social responsibility improve with sustainable entrepreneurship education thereby enabling more sustainable behavior.

Schools and universities can help in spreading sustainable entrepreneurship. According to the studies, education, personal and systematic knowledge important for sustainable entrepreneurship in Pakistan.

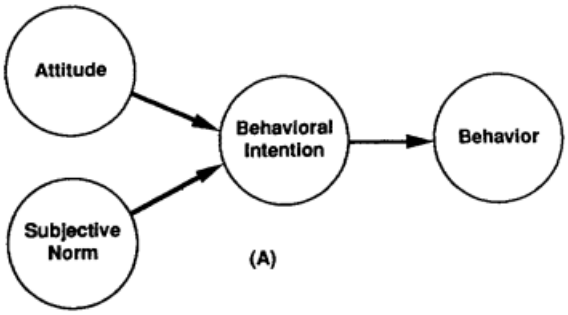
2.9.Supporting Theories for Sustainable Entrepreneurship

2.9.1. Theory of planned behavior

The reasoned action theory asserts that the immediate antecedent of individuals' behavior is their intention. The basis of this theory is the assumption that individuals typically behave sensibly; through this process, they consider accessible information and, they think about their actions' implications explicitly or implicitly. As reasoned action theory is concentrated on volitional behaviors, it maintains that the individuals' intention to perform (or not to perform) a certain behavior is the immediate determinant of that behavior (Ajzen, 1985). As Figure 2.3 displays, this theory assumes that intention could be predicted by considering the attitudes and subjective norms.

Briefly, according to the reasoned action theory, individuals generally perform a certain action when they think it is positive and when they think important others believe they should do that action (Ajzen, 1985). In the same sense, the planned behavior theory, as an extended version of the reasoned action theory, assumes that there are three conceptually independent determinants for any intention (see Figure 2.4). Intention to carry out behaviors of different kinds could be predicted accurately considering the attitudes towards that behavior, subjective norms, and perceived behavioral control. These intentions in association with the perceptions of behavioral control account for significant variance in actual behavior.

Subjective norms, attitudes, and perceived behavioral control have relationship with suitable sets of salient behavioral, normative, and control beliefs regarding the behavior; however, there is not clear understanding about the exact nature of these relations (Ajzen, 1991). Attitude towards behavior is the extent to which the individual considers the behavior favorable or unfavorable. On the other hand, subjective norm refers to the perceived social pressure about performing or not performing the behavior. Finally, the degree of perceived behavioral control is a new antecedent of intention, which is not part of the reasoned action theory. It refers to the perceived difficulty or ease of doing the behavior, and it can reflect not only experience, but also he predicted obstacles (Beck & Ajzen, 1991).



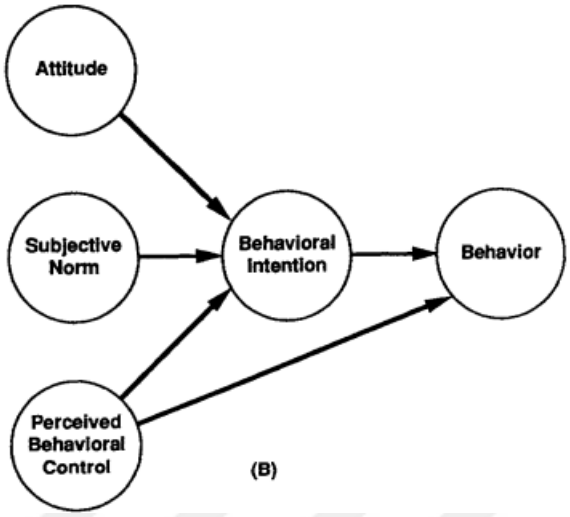


Figure 2.3: (A) Theory of Reasoned Action

Figure 2.4: (B) Theory of Planned Behaviour

Source: Madden et al., 1992

Typically, if an individual has a more favorable attitude and subjective norm regarding a certain behavior and perceives greater behavioral control, s/he will have stronger intention to perform it. Intention has been widely recognized as an immediate antecedent of actual behavior. In fact, those with stronger intention to perform a behavior or to attain their behavioral goals are predicted to be more successful (Beck & Ajzen, 1991).

In 2005, Ajzen expanded the theory of planned behavior stating that beliefs are foundation of intention and behavior (see Figure 2.4). He stated that attitudes are determined by beliefs about the consequences of the behavior, which is called *behavioural beliefs*(Ajzen, 2005). The beliefs that underlie perceived subjective norms are termed *normative beliefs*. If a person believes important referents will support and approve a behaviour, they perceive social pressure to do so (Ajzen, 1991). Lastly, there

are control beliefs that deal with perception of person about ability to perform a particular behavior. These beliefs are influenced by background factors personal, social and informational factors such as education, values, personality traits, emotion, experience, knowledge, media exposure, etc. (Ajzen, 2005). Further details are illustrated in Figure 2.5.

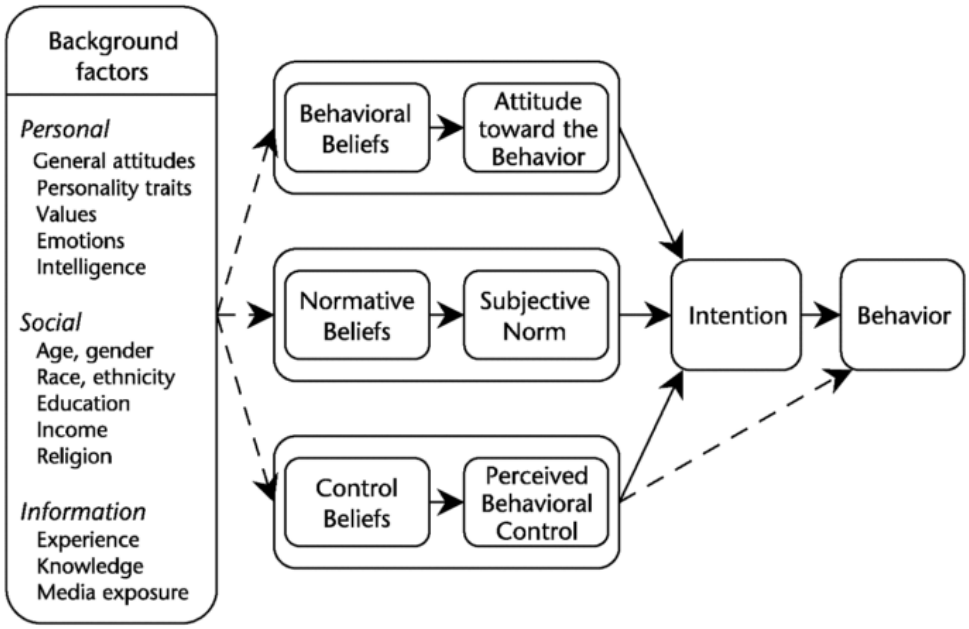


Figure 2.5: The role of background factors in the theory of planned behaviour
Source: Ajzen, 2005

Although intention is suggested as one of the strongest predictors of behavior, all intentions do not necessarily translate into action; some intentions may be abandoned, while other intentions are revised to fit varying settings (Ajzen, 1985). In other words, although individuals' intentions guide actions, it is argued that the translating of intentions into actual behavior is a complex process (Ajzen, 2001). It is not surprising that circumstantial factors or opportunities play an important role in this regard. When opportunity is absent, an attempted behavior could be easily disrupted; if an individual attempts to perform something based on their intentions, they may fail just because the present circumstance prevents people from carrying out such behavior (Ajzen, 1985).

2.9.2. Agenda setting theory

Agenda setting was first introduced by Mccombs in 1992 and since then was used in several studies (e.g., (Chernov et al., 2011; Trivedi et al., 2018). Agenda setting theory attributes its intellectual origin to Walter Lippmann's (1922) Public Opinion stating

that the news media construct a pseudo-environment for the public bridging “the world outside and pictures in our heads” (Lippmann, 1922 cited by Lei Guo, Maxwell McCombs 2011).

The agenda-setting theory basically claims that the media shape individuals’ understanding of much of social reality (Shaw, 1979). It further maintains that they determine what to think about and, at the same time, how to think about that. In other words, the media influence individuals’ mind when selecting subjects for attention and also the frames for thinking about the subjects (Mccombs & Donald, 1992). According to this theory, the media act highly persuasively and uniquely when exerting their impacts on people’s mind (Shaw, 1979). The causality relationship indicates that when the media increase their attention on a subject, the community’s concern about that particular subject increases, too. In this sense, the media do not necessarily reflect public priorities; rather, they attempt to shape them (Brown & Deegan, 1998).

To sum up, the agenda setting theory posits that media direct public attention to certain subjects, issues and events. Additionally, media is capable to determine what is important/unimportant, what deserves attention/neglection and what people should be aware/unaware.

2.9.3. Social Cognitive Theory (SCT)

Social Cognitive Theory devised by Albert Bandura attempts to explain human behavior and has been successful in doing so. It highlights the influence between one’s own behavior and social environment - SCT was first developed from social learning theory which was later extended to a larger model of behaviour change and self-regulation.

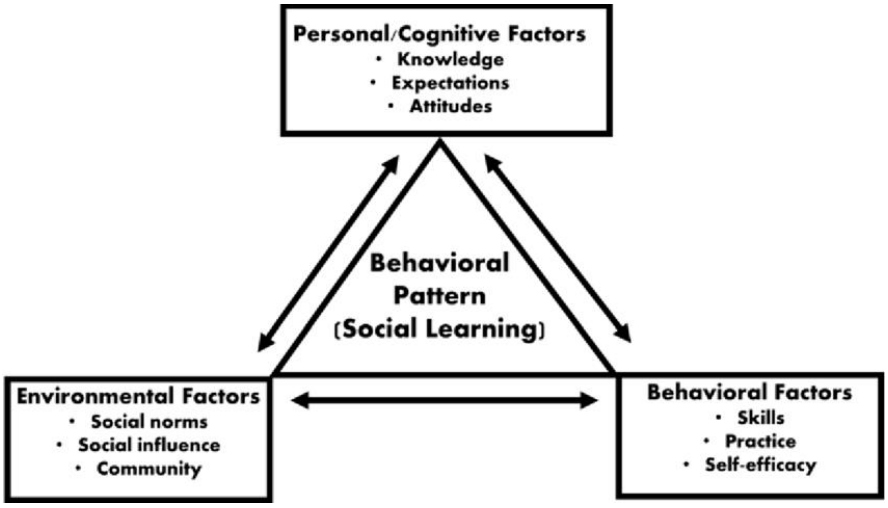


Figure 2.6: Social Cognitive theory framework

Source: Bandura, 1986

Bandura (1986) stated that individuals are not mere products of their environment but rather play a role in their own development. His theory extended behaviorism to include additional cognitive processes such as attention, memory, and motivation which act as mediators of learning and decision making.

2.9.4. Other interlinked theories:

The concepts and theories behind sustainable entrepreneurship have their origins in the disciplines of entrepreneurship and sustainability. The Triple Bottom Line (TBL) Theory designed by Elkington (1997) broadens the traditional focus on economic profit to explicit focus on social and environmental profit. This theory focuses on how the business you perform should not only make profit but also benefit the society and do good to the environment. Similarly, in "Ecopreneurship Theory", an entrepreneur is an ecological innovator in producing and consuming sustainably. Entrepreneurs who apply this approach usually incorporate green concerns into their business plans, dealing with important environmental problems and making profit (Schaper, 2002).

The **Institutional Theory** talks about how entrepreneurship is shaped by the society where it exists. Entrepreneurs who act in the confines of institutions are pushed by regulators and society to adopt practices which help in sustainability, and they convert them into opportunities (Delmas & Toffel, 2004. Similarly, **Resource-Based View (RBV)** states that the firms achieve competitive advantage by using valuable and

unique resources that are not easily malleable. Entrepreneurs who follow rules have to respond to pressures of law and society. They do so by adopting practices that create opportunities (Barney, 1991; Hart, 1995).

In (1984) Freeman developed the **Stakeholder Theory** which states that different stakeholders like customers, employees, suppliers, society, etc., must be involved in the business. Sustainable entrepreneurs utilize stakeholder collaboration that helps build trust and co-creating solutions. It helps ensure alignment of practices. In addition, the (1934) theory of **creative destruction** by Schumpeter applies to sustainable entrepreneurship to demonstrate how innovative businesses disrupt existing markets to introduce eco-friendly substitutes and responsible alternatives, thus causing systemic change (Hockerts & Wüstenhagen, 2010).

The Sustainable Business Model Theory describes how to build a business framework that creates and delivers value sustainably. Entrepreneurs that undertake such approaches frequently implement circular supply chains, product-as-a-service models, and so on that create value for society, the environment, and the economy. (Bocken et al., 2014) Also, there is the Social Ecological Systems (SES) Theory which studies overlapping social and ecological systems. It addresses resilience and sustainability. Entrepreneurs are viewed as key actors who are resilient to environmental change and affect resource management strategies (Ostrom, 2009).

In the end, the Behavioral Theory of Sustainability looks at the psychological and motivational factors of entrepreneurs driving their actions for sustainability. Sustainable entrepreneurs are motivated by an ethical responsibility along with an environmental concern and not just by the rewards (Shepherd & Patzelt, 2011). All together, these theories give a detailed perspective on sustainable entrepreneurship that it has the wherewithal to handle the global woes on condition that innovation, resource use and stakeholder engagement apply the rest of sustainability. These frameworks show that sustainable entrepreneurship has the power to impact a future that is more sustainable and equal.

2.10. Adoption of Theories:

The study's conceptual framework is based on behavioral and entrepreneurial theories explaining cognitive and contextual factors influencing the behavior of sustainable entrepreneurs. This research is mainly based upon TPB (Theory of Planned Behavior)

of Ajzen (1991), which is the closest among them. The TPB provides a well-established framework for how people make intentions and translate those into behavior through their own attitudes, social expectations, and control over the behavior.

This research proposes that the entrepreneurial attitude, subjective norms, self-efficacy, and perceived barriers significantly affect an individual's intention to engage in sustainable entrepreneurship, which influences their sustainable entrepreneurial behavior. These links represent the precise connections predicted in TPB; intention is the closest predictor of behavior in this model, where the behavior is influenced by attitudinal and normative beliefs, moderated by perceived behavioral control.

Specifically, self-efficacy, which is the key construct of this research, is considered a proxy variable for perceived behavioral control, and it shares a direct correspondence with the TPB's selected focus on people's beliefs about performing a specific behavior. Also, the adding of moderating variables like entrepreneurial education and situational factors is consistent with the later work of Ajzen (2005) which recognized that background and contextual circumstances could either enable or inhibit the conversion of intention into action.

In addition to TPB, SCT by Bandura (1986) offers added explanatory power. SCT focuses on reciprocal determinism that personal factors (e.g. self-confidence), behavior, and environmental (e.g. education, context) interact mutually. The inclusion of SCT supports that sustainable entrepreneurial behavior is not only driven by intentions but also because of learning, role modelling, plus access to enabling environments. According to SCT, the incorporation of entrepreneurial education and situation as moderator factors is supported due to the behavioral capability and environmental feedback.

Also, the study conceptually extends to more specified sustainability and entrepreneurship theories. This includes Triple Bottom Line (TBL) theory (Elkington, 1997) which gives the normative underpinning for why sustainable conduct matters; Institutional Theory, which stresses the importance of regulatory and social pressures for entrepreneurial action; and Stakeholder Theory (Freeman, 1984), which normatively justifies the incorporation of social norms as a factor influencing entrepreneurial action.

In conclusion, the Theory of Planned Behavior which directly relates to this structure, is the closest theory to this study. It shows how cognitive factors directly influence intention and behavior. Social Cognitive Theory enriches this foundation through its take on the role of self-efficacy and environmental conditions. Theories related to sustainability offer greater contextualization for the what and the why of sustainable entrepreneurial action.

2.11. Research framework

This paper constructed a conceptual framework for the present study based on literature review and theoretical gaps. The conceptual framework would be primarily based on TPB. The behavior is predicted by behavioral intention in the best way. And that intention is influenced by three core antecedents, i.e. attitude to behavior, subjective norms, and perceived behavioral control (Ajzen, 1991). The stronger these factors, the more likely an individual is to form a strong intention to act (Beck & Ajzen, 1991).

Following this theory, the present framework (see figure 2.7) studies the impact of entrepreneurial attitude, subjective norms, self-efficacy (as a measure of perceived behavioral control), and perceived barriers on sustainable entrepreneurial intention which in turn predicts sustainable entrepreneurial behavior. Another reason why the authors use Social Cognitive Theory (Bandura, 1986) for their framework is because they believe entrepreneurial education and situational factors are environmental factors that moderate the intention-behavior relationship. Meaning, it is a two-way street whereby personal agency, behavior, and environment influence each other.

The framework also considers how entrepreneurial cognitive antecedents (attitude, self-efficacy, norms, and barriers) influence behavior through sustainable entrepreneurial intention, that is, sustainable entrepreneurial intention is expected to impact entrepreneurial behavior. The model of entrepreneurial behavior that is sustainable is shown in Figure 2.7.

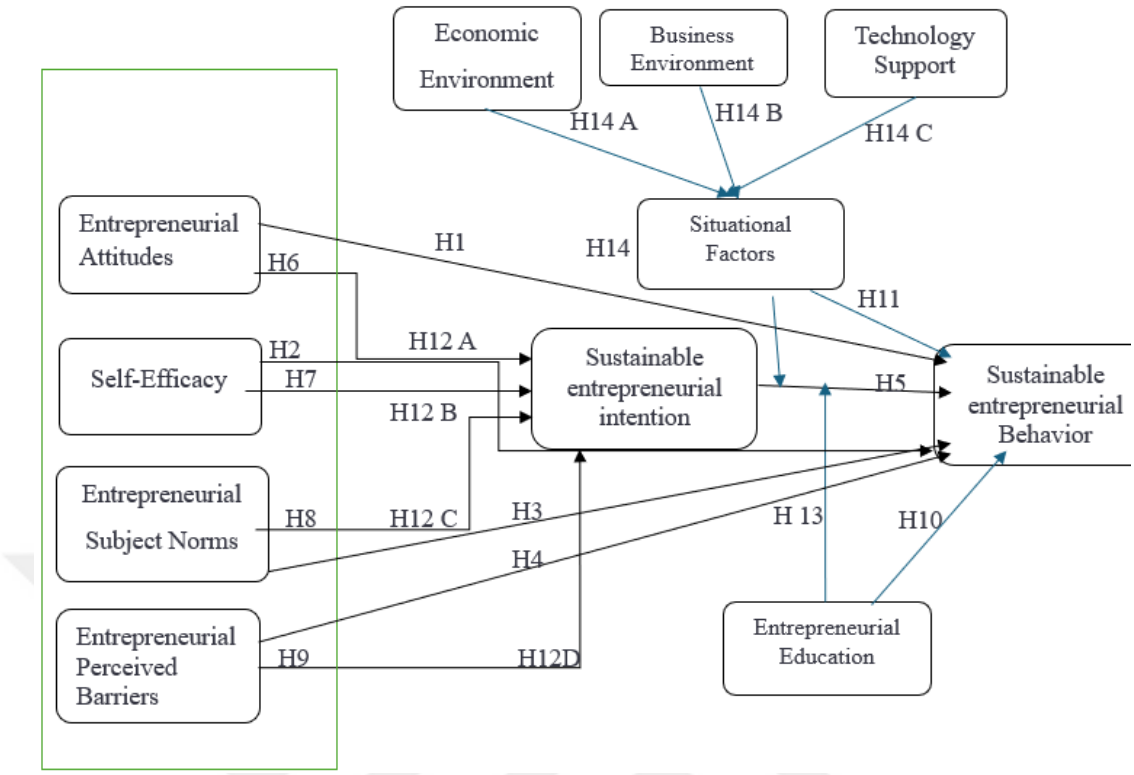


Figure 2.7: Research Framework
Source: Author

2.12. Hypotheses Development

2.12.1. Entrepreneurial Attitudes Toward Sustainable Entrepreneurship

Multiple studies suggest that entrepreneurs' attitude or perception of sustainable entrepreneurship are shaped by a complex web of individual beliefs, social beliefs, and perceptions of personal agency. Research indicates that attitudes toward sustainability and entrepreneurship influence the likelihood of an individual engaging in sustainable business practices. For instance, research in Lithuania and Latvia shows that gender does not greatly influence the motivation to establish a sustainable business but personal views towards sustainable development is influenced by age (Titko et al., 2023). In Pakistan, the intent to become a sustainable entrepreneur is significantly predicted by their environmental values and perceived behavior control. Subjective standards appear to be less impactful (Yasir et al., 2023). “Attitudes, norms, and control are key influencers of entrepreneurial decision-making, and this is often explained by the theory of planned behavior (Jebsen et al., 2023; Hirschfeld & Wagner, 2022).”

Numerous scholars have investigated the relationship between attitude and intention. The results consistently have shown a positive significant and direct relationship between attitude and entrepreneurial intention (Krueger et al., 2000; Lüthje and Franke, 2003; Ferreira et al., 2012; Yurtkoru et al., 2014; Liñán et al., 2015; Usaci, 2015; Ambad and Damit, 2016; Farooq et al., 2016; Rosique-Blasco et al., 2017; Shah and Soomro, 2017; Usman and Yennita, 2019). One of the studies that compared students' attitudes in developing and developed countries found interesting results indicating that students from emerging economies hold more positive attitudes toward entrepreneurship as future career (Davey et al., 2011). At the same time, in a different study, (Pihie and Bagheri, 2011) investigated the attitudes of Malay students and concluded that students possess high entrepreneurial attitudes. In other words, Malay students hold positive attitudes toward pursuing entrepreneurship as career.

According to Meslem et al., the aspirations towards sustainable entrepreneurship for students have internal and external factors in Algeria (2024). Internal factors are entrepreneurial perceived viability. External factors are social networks. A study from Pakistan (Yasir et al., 2022) shows how personal values like self-betterment and self-nonexistence have an important role to play in inculcating long-term entrepreneurial intentions. Bringing a person's and community's beliefs and practices in line with entrepreneurial practices is important for sustainable entrepreneurship. Further, doing this is a complex process that requires a multi-pronged approach. Thus, it must be educational, cultural, and institutional.

Several researchers have focused on the impacts of individuals' attitudes on their intention to engage in entrepreneurship activities. Although, the literature still lacks research in the sustainable entrepreneurship domain. The current study aims to fill this gap through carrying out an investigation on this relationship. Therefore, this study proposes the following hypothesis:

H1. ENT-Att----------→ Se Behavior

There is a direct effect of Entrepreneurial attitude on sustainable entrepreneurial behavior.

H6. ENT-Att ----------→SE Intention

There is a direct effect of entrepreneurial attitude on sustainable Entrepreneurial intention.

2.12.2. Self-Efficacy Toward Sustainable Entrepreneurship

Self-efficacy is important for sustainable entrepreneurship, as it affects individuals' intentions and capabilities to engage in sustainable entrepreneurial activities. The studies highlighted the factors affecting the development of self-efficacy in sustainable entrepreneurship which included education, personal attitudes and organizational capabilities(Broccia et al., 2022). Self-efficacy mediates the relationship of various antecedents with sustainable entrepreneurial intentions.

An example is green entrepreneurial self-efficacy which contests the sustainable use of entrepreneurship and green entrepreneurial intentions, which accredits the green entrepreneurial intentions into actionable outcome (Ediagbonya et al., 2024). The motivations behind enterprise, either good opportunity or compelling necessity help regulate the influence of self-efficacy on sustainable entrepreneurship. According to (Broccia et al., 2022), self-efficacy both motivates and enables sustainable entrepreneurship activities.

Even though self-efficacy is a meaningful cause of sustainable entrepreneurship, it is important to take the wider context into account. The effectiveness of self-efficacy in fostering sustainability-minded entrepreneurship depends on factors like prior experience, culture, economy and more. For example, the effect of sustainable entrepreneurship on self-efficacy will depend on students' previous experience, which may indicate that the educational offer has to consider different backgrounds and experiences (Gamarra-Chávez et al., 2025). The following hypothesis is formed:

H2. Self-Efy ----------→Se Behavior

There is a direct effect of Self efficacy on sustainable entrepreneurial behavior.

H7. Self-Efy ----------→SE Intention

There is a direct effect of self-efficacy on sustainable Entrepreneurial intention.

H12B. Self-Efy ------→ SE Intention------→ Se Behavior

Sustainable entrepreneurial intention plays a mediating role in the relationship between Self efficacy and sustainable entrepreneurial behavior.

2.12.3. Entrepreneurial Subject Norms and sustainable entrepreneurship

Subjective norms refer to the belief that an important person or group of people will approve and support a particular behavior. Subjective norms are determined by the

perceived social pressure from others for an individual to behave in a certain manner and their motivation to comply with those people's views(Ham et al., 2015). According to the theory of planned behavior, subjective norm is known as one of the predictors of entrepreneurial intention. Based on this theory, numerous studies have tested impact of subjective norm on entrepreneurial intention(Che et al., 2015; Gujrati et al., 2019; Maresch et al., 2016; Mohammed et al., 2017; Saraih et al., 2018). In a study by (Krithika and Venkatachalam, 2014), 100 respondents were selected based on the stratified random sampling. The result says that there is a significant relationship between subjective norms and entrepreneurial intention among the business students in Bangalore. Similarly (Alqasa et al., 2014) found out that there is significant and positive relationship between subjective norm and behavioral intention to use banking services in the context of Yemen. In the realm of tourism, (Kaushik et al., 2015) concluded that subjective norm considerably affects tourists' behavioral intention towards adopting new technologies. In 2021, (Baharuddin and Ab Rahman, 2021)carried out an empirical study and the findings revealed that Subjective Norms has the strongest effect on entrepreneurial Intention of undergraduate students. In the context of Indonesia, (Santoso, 2021) could find significant evidence for the positive influence of subjective norm on entrepreneurial Intention

While the abovementioned studies found considerable positive impact of subjective norm on entrepreneurial intention, others failed to find any evidence for significant relationship between subjective norm and intention to become an entrepreneur. For instance, (Roberta et al., 2019)highlighted that subjective norm is not significantly contributing to entrepreneurial intentions. (Mahmoud et al., 2020)who surveyed a sample of 293 students in Nigeria, found that SN has an insignificant relationship with entrepreneurial intention. Most recently, research conducted on a sample of over 330 Polish students revealed that subjective norms do not play a significant role in the entrepreneurial intention (Kobylińska, 2022).

The role of the subjective norm seems to be mixed and inconclusive (Schepers & Wetzels, 2007), As a result, the current study investigates how subjective norm of students' affect their intentions to become a sustainable entrepreneur. Experts believe that sustainable entrepreneurs are not born but become so through levels of effective education. Accordingly, the following hypothesis is formed.

H3. Ent Norm --------→ Se Behavior

There is a direct effect of entrepreneurial subject Norms on sustainable entrepreneurial behavior.

H8. Ent Norm ----------→SE Intention

There is a direct effect of entrepreneurial subject Norms on sustainable entrepreneurial intention.

2.12.4. Entrepreneurial Perceived Barriers and Sustainable Entrepreneurship

Sustainable entrepreneurship deals with making progress regarding environmental, economic and social goals, but a lot of challenges are there regarding sustainable entrepreneurship unlike traditional entrepreneurship. Sustainable entrepreneurs may find it difficult to establish and grow businesses due to these perceived barriers (Peng & Walid, 2022). The challenges are establishment, economic, regulatory, social, and technological that are viewed as obstacles for sustainable scaling. Creating environments that foster sustainable entrepreneurship means we need to understand these barriers(Hoogendoorn et al., 2019).

As sustainable entrepreneurs must deal with environmental inconsistencies and lack of government incentives, it becomes a challenge for them. Investment and innovation in sustainable practices can be discouraged by these obstacles. Social Issues, such as consumers not wanting to pay higher prices for sustainable goods and not wanting to develop new habits(Hoogendoorn et al., 2019). Due to certain attitudes in society, sustainable businesses may not get the adequate market. Support from the government can help reduce perceived risks and obstacles due to sustainable entrepreneurship. Government support and effective policies can curb the challenges of sustainable entrepreneurs and help them succeed (Peng & Walid, 2022).

Demographic factors including age and education level may also influence the likelihood of engaging in sustainable entrepreneurship where younger and highly educated people are more likely to engage in green practices. (Eroglu & Rashid, 2022) (Hoogendoorn et al., 2011) While perceived barriers are serious obstacles to sustainable entrepreneurship, they also indicate possibilities for targeted interventions. An example is that the demand for sustainable products by consumers and technology results in an opportunity. One important way to overcome the challenges is to enable a supportive ecosystem through policymaker-business-investors synergies that can

lead to profitable growth with social good (Stoica, 2024; Egieya et al., 2023). Considering these factors we formulate the following hypothesis:

H4. PBarrier ----------→ Se Behavior

There is a direct effect of perceived barriers on sustainable entrepreneurial behavior.

H9. PBarrier ----------→SE Intention

There is a direct effect of perceived barriers on sustainable entrepreneurial intentions.

2.12.5. Mediating Role of Sustainable Entrepreneurial Intention Perception

The mediating role for perception of sustainable entrepreneurial intention is of utmost importance as it helps in understanding how various elements influence sustainable entrepreneurship(Vuorio et al., 2018). Many studies show that the perception of environmental issues relates positively to the antecedents like education; self-efficacy; and environmental values and consequence of entrepreneurial activities. Sustainable entrepreneurial intention perception may help to translate potential into practice by mediating these relationships(Kimuli et al., 2020). This section will review the mediating role of perception around sustainable entrepreneurial intention across different settings and factors.

The entrepreneurial intentions that lead to sustainable entrepreneurship will form owing to entrepreneurial self-efficacy, proactive personality, and creativity. The latter relationship is mediated by entrepreneurial alertness ,which is important in sustainable entrepreneurship (Yasir et al., 2020).

Resilience and quality of life also play mediating roles. According to Hamzah et al. (2024), resilience indirectly predicts quality of life. Furthermore, the quality of life mediates the relationship between resilience and sustainable entrepreneurial intention.

Sustainable entrepreneurial intentions influence the performance of SMEs significantly with the help of sustainable entrepreneurship in between them. Integrating sustainability into businesses can enhance performance (Anwar et al., 2024). Although the literature showcases several published studies on the mediating role of sustainable entrepreneurial intention perception, there arise several questions in the context related to globalization. Situations such as culture, economy and policies will affect the reliability of these mediating roles (Gimenez-Jimenez & Harc, 2024).

As entrepreneurship is dynamic, there are likely to be changes in relationships over time. Therefore, it requires researchers to adapt with time.

In this study intention is considered as a mediating variable to fulfil the attitude-intention gap which refers to the fact that having positive attitudes do not necessarily translate into intentions or behaviors (Wang et al., 2021)(Kurdi et al., 2022). To address the gaps and contribute to the scare literature on entrepreneurial intention (Hassan et al., 2020), the following hypothesis is formed:

H5. SE.Intention --------→ Se Behavior

There is a direct effect of entrepreneurial Intention on sustainable entrepreneurial behavior.

H12A. ENT-Att ------→ SE Intention------→ Se Behavior

Sustainable entrepreneurial Intention plays a mediating role in the relationship between entrepreneurial attitude and sustainable entrepreneurial behavior.

H12B. Self-Efy ------→ SE Intention------→ Se Behavior

Sustainable entrepreneurial intention plays a mediating role in the relationship between Self efficacy and sustainable entrepreneurial behavior.

H12C EntSNorm ------→ SE Intention------→ Se Behavior

Sustainable Entrepreneurial Intention plays a mediating role in the relationship between Entrepreneurial subject Norms and sustainable entrepreneurial behavior.

H12D. PBarrier -------→ SE Intention------→ Se Behavior

Sustainable entrepreneurial intentions play a mediating role in the relationship between perceived barriers and sustainable entrepreneurial behavior.

2.12.6. Moderating Factors and effects on Sustainable entrepreneurship

The interaction among entrepreneurial education and situational factors (Economic Environment, Business Environment, and Technological Support) can generate sustainable entrepreneurial output (Kang, 2022; Vuorio et al., 2018). For example, the introduction of sustainability-driven courses in entrepreneurship education has been established to also boost students' self-belief and intentions in the area of sustainability which create enhanced real-world entrepreneurial behavior. In addition to this, different external variables such as the market in which one doing business and

technology can influence one's attitude;(Z. Hussain et al., 2022; Muralidharan & Pathak, 2020) if a entrepreneur feels there is a strong support from the business environment, he can translate his sustainable intention into a behavior. This highlights the need to build supportive ecosystems that not only help to develop entrepreneurial aspirations but also help to attain greater sustainability goals, which in turn enhance environmental stewardship.

In addition, sustainability-oriented entrepreneurial education not only encourages intention or behavior but also builds an innovative-friendly mindset(Zwarteveen et al., n.d.). When students engage with sustainable entrepreneurship, they develop competencies such as systems thinking and anticipatory thinking that are critical for understanding and addressing environmental challenges. I believe with sustainability education you get more self-efficacy and like to do something about it. So, one will be more likely to be sustainable business if one gets sustainability education.

Research suggests that students can enhance their self-efficacy as they get an opportunity to see the positive impact of their entrepreneurship activities on the community and environment(Klapper & Fayolle, 2023). As they face real market realities and stakeholder expectations, these future entrepreneurs will build vital resilience and adaptability, which are essential for success. All in all, this complete education system helps you become not just entrepreneurs but leaders who will achieve the necessary change to make this world sustainable. Based on these findings and to improve the significance of this framework we formulate the following hypothesis.

H13. Ent-Education X SE Intention -----→ Se Behavior

Entrepreneurial education has a moderating effect in the relationship between sustainable entrepreneurial intention and sustainable entrepreneurial behavior.

H14. Situ.Factors X SE Intention ----→ Se Behavior

Situational factors have a moderating effect in the relationship between sustainable entrepreneurial intention and sustainable entrepreneurial behavior.

H14 A. Eco. Environment X SE Intention ----→ Se Behavior

Economic Environment has a moderating effect in the relationship between sustainable entrepreneurial intention and sustainable entrepreneurial behavior.

H14. Bussines.Support X SE Intention ----→ Se Behavior

Business Environment has a moderating effect in the relationship between sustainable entrepreneurial intention and sustainable entrepreneurial behavior.

H14 C. Tech.Support X SE Intention ----→ Se Behavior

Technology Support has a moderating effect in the relationship between sustainable entrepreneurial intention and sustainable entrepreneurial behavior.

CHAPTER III

RESEARCH METHODOLOGY

3.1. Introduction

This chapter refers to an explanation of the research methodology and empirical techniques that help finding a suitable answer for research questions. The first part of the chapter elaborates research philosophy and the justification of selecting positivism paradigm. Along with the document analysis of the related topics, research methodology is discussed with the reasons to employ quantitative method in this study. Next, the research process for quantitative methods is elaborated. The chapter continues with detailed explanation of the document analysis, research design, data collection procedure and sampling. After presenting the measurement scales for research variables, data screening and data analysis methods are discussed.

3.2. Research philosophy

The first step of any study is to decide upon the quantitative or qualitative method of research. The most crucial issue is the identification of the research paradigm. The methodology is just one aspect of a particular paradigm within which researchers work, either overtly or implicitly (Sobh & Perry, 2006) . The research philosophy defines the choice of quantitative, qualitative or mixed approaches for that study. The research philosophy shows how particular research views the world and the nature of the research. Discipline orientations, the researcher's inclination and past research experience affect the investigation philosophy (Creswell, 2014).

Different research philosophies are mentioned in the literature including positivism, realism, interpretivism, objectivism, subjectivism and pragmatism (MacLean, 2013). However, widely discussed philosophies in literature are positivism, constructivism, and pragmatism (Creswell, 2014). Positivism suggests researchers accept the reality of the world as well as our ability to explore the realities existing in this real entity(Nicholas, 2010). This philosophy is more in line with quantitative approaches to the processes of collecting and analyzing data (Mackenzie & Knipe, 2006). On the other hand, constructivism asserts that individuals 'construct' their world and this could be the driving force behind any investigation in the social science domain(Sobh & Perry, 2006). Pragmatism approach belongs to the situation that the researcher focuses on the problem rather than that method (Creswell, 2014), hence, for a better

understanding of the problem the strengthen of both approaches are combined (Morgan, 1998).

The main elements of the research philosophy include ontology, epistemology and methodology (GUBA and Yvonnas Lincoln, 1994; Saunders et al., 2009). Essentially, ontology is "reality", epistemology is the relationship between that reality and the researcher and methodology is the technique used by the researcher to discover that reality (Sobh & Perry, 2006). Table 3.1 comprises different research philosophies.

Table 3.1: Comparison of Research Philosophies

Elements	Positivism	Constructivism	Pragmatism
Ontology	Single reality	Subjective, multiple realities	External, multiple
Epistemology	Investigator and research are independent	Investigator is a part of research	Mixture of roles
Research method	Quantitative	Qualitative	Mixed method

Source: Guba and Lincoln, 1994, Saunders *et al.* 2009 and Creswell, 2014

Another difference between positivism and constructivism stems from the theoretical approach. While positivism follows a deductive approach, constructivism belongs to inductive approach (Creswell, 2012). In a quantitative study, the existing literature is employed in a deductive way as a framework that helps to set research questions or hypotheses. Indeed, this type of study first takes advantage of literature to achieve the best directions for determining the research questions or hypotheses. In contrast, in qualitative research, literature is used inductively moving from specific to general fact. Since qualitative research is exploratory, it is difficult for researchers to find much documented information regarding the topic or the research population. In this type of research, participants should be listened to in order to achieve the required understanding about the research topic(Creswell & Creswell, 2017). The use of the

mixed method, however, helps to organize a single study investigating both the complex nature of the phenomenon of interest from the participants' perspectives and the different associations among the quantifiable variables (Williams, 2007). The current research follows positivism research philosophy due to the reasons that are explained in the following section.

3.2.1. Justification of Positivism Philosophy

In this study, considering the research questions and nature of the research, the appropriate research philosophy is positivism. The reason for selection of this philosophy is that there is only one reality and the independent variable will not be investigated through the different perspective of participants. Additionally, the researcher will not play an active role during data collection. That is, after preparing the questionnaire based on the previous literature, the respondents will be asked to take part in survey by answering close-end questions. The next justification to follow positivism paradigm is that this research has a deductive approach. In this approach, the literature is investigated for better understanding of the problem and forming research questions. Then, theories are used to support the proposed research framework and research hypotheses. Therefore, considering all the above stated reasons the philosophical approach of this study is positivism which ties with quantitative research method. The explanation of the quantitative method is presented in the next section.

3.3. Research Methodology

Quantitative research design refers to some procedures logically set in order to collect, analyze, and report numeric data to give effective answers to a set of predefined research questions and test hypotheses in regard to some definite variables (Clark & Creswell, 2015). On the other hand, qualitative research is an attempt to explore and understand the meaning people attribute to a certain social or human problem. In a qualitative study, questions and procedures emerge, data are gathered within the participants' settings, data is analyzed in an inductive manner building from particulars to general themes, and finally the meaning of the data is interpreted by the researcher (Creswell, 2014). The mixed method, which is a combination of the qualitative and quantitative method, answers questions using the techniques of both methods (Williams, 2007). In quantitative research enough detail about a study design is provided for it to be replicated for verification and reassurance. In qualitative research

little attention is paid to study designs or the other structural aspects of a study, hence the replication of a study design becomes almost impossible. This leads to the inability of the designs to produce findings that can be replicated. In contrast, findings through quantitative study designs can be replicated and retested whereas this cannot be easily done by using qualitative study designs (Kumar & Ranjit, 2011).

This study employs the quantitative method for the following reasons. First, as it was explained earlier in this chapter, this study has a positivism approach to research which matches with quantitative method. Second, the present study has a deductive approach with hypotheses that are set up based on the extant theories. These hypotheses are tested with statistical tools in the form of numeric data. As is highlighted by Creswell (2014), quantitative research has assumptions about testing theories deductively, building in protections against bias, controlling for alternative explanations, and being able to generalize and replicate the findings. In this study, theory of planned behavior and agenda setting theories are used to support research hypotheses that are developed based on literature review. Then, the numerical data will be collected to test these hypotheses. Since the data will be collected from a large sample in comparison with qualitative method, the findings are generalizable. Third, a quantitative method provides an opportunity to describe trends, attitudes, or opinions of a population by studying a sample of that population (Creswell & Creswell, 2017). This study will attempt to understand the intention of students to engage in sustianble entrepreneurial activities by conducting a survey. Quantitative method translates a research problem into data for analysis so as to provide relevant answers to research questions at a minimum cost (Asenahabi, 2019). Since the questions that are developed in this study are not concerned about “why” or “how”, the quantitative method is more suitable to find the relevant answers.

3.4. Research Design

For successful implementation of any research, suitable research design is required. Research design is a plan used by a researcher to start collecting data to accomplish the research objectives validly. It essentially refers to translating a research problem into analyzable data to find the most suitable answers to the research questions at the lowest cost (Asenahabi, 2019). (Kumar and Ranjit, 2011) believe that research design in fact plans how to complete research. It provides a structure and strategy for research in a way to best answer the questions set for the study. As Figure 3.2 illustrates,

quantitative research designs are classified into two groups: experimental and non-experimental (Clark & Creswell, 2015).

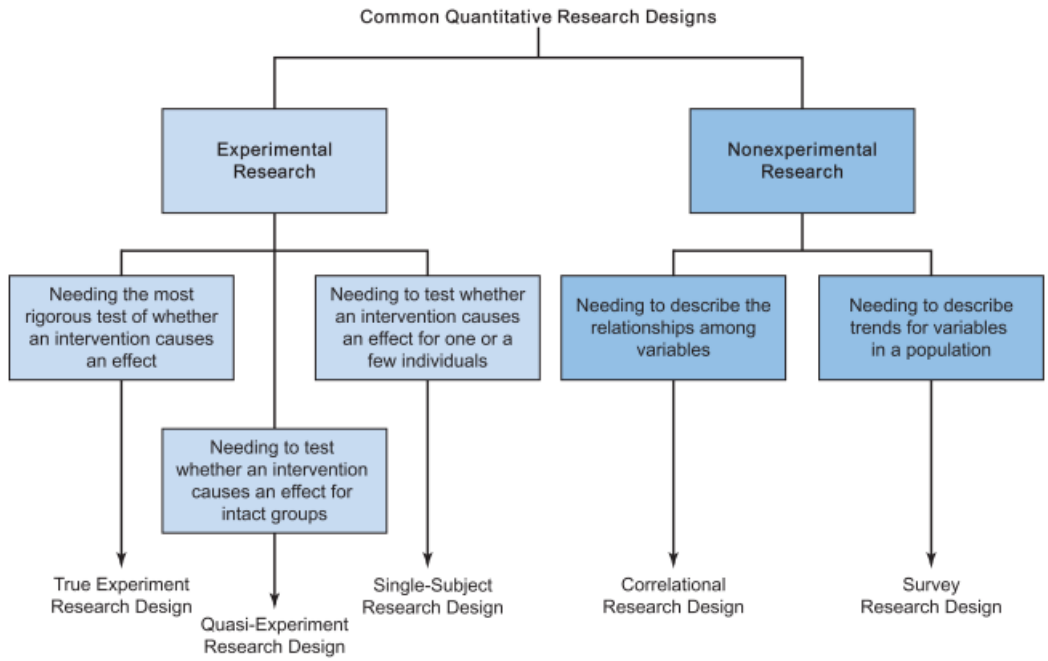


Figure 3.1. Quantitative Research Design

Source: Clark & Creswell, 2015

Experimental design in fact examines how a treatment (or an intervention) affects an outcome and helps to control all other factors that can affect it (Creswell & Creswell, 2017). On the other hand, in a non-experimental design, there is no room for any experiment to be performed during the data gathering procedure. It is generally classified into two sub-groups: survey design and correlational design (Asenahabi, 2019). In a survey design, the attitudes, trends, or opinions of a population are described quantitatively or numerically through investigating a single sample from among that population. Afterwards, the results obtained from the selected sample are generalized to the whole population (Creswell & Creswell, 2017). The present study falls into non-experimental research design category- survey design. This is mainly because the present research aims to describe and investigate the intention of students by distributing a questionnaire among them. The findings based on the selected sample can be generalized into the whole population.

In this study, a 5-point Likert scale is used to measure the research questions; the scale ranges from strongly agree to strongly disagreement. An advantage of the Likert scale

is the ability to indicate the level of agreement/disagreement with a statement quickly (Vaus, 2002). Additionally, the close-ended questions are asked by the students because it helps respondents to make quicker choices. Another advantage of close-ended questions is less challenging coding and data analysis process (Sekaran, 2013).

The questionnaire begins with a short introduction which introduces researchers and provides contact information, purpose of the study and estimated time to take part in the survey. The first section is allocated to demographic questions that investigate the background and profile of respondents. The second section focuses on asking the main research questions in regard with perceived barriers, Attitudes, Self efficacy, Subject norms, educational support situational factors (i.e. Economic and business environment and technology support) and sustainable entrepreneurial intentions.

3.4.1. Data Collection

Data regarding a certain person, situation, phenomenon, or problem could be collected by adopting two major approaches. In accordance with these broad approaches to data collection, data is classified as secondary sources and primary sources (Kumar & Ranjit, 2011). As is indicated in Figure 3.3, secondary sources are based on available documents whereas primary sources are obtained through interview, observation and questionnaire.

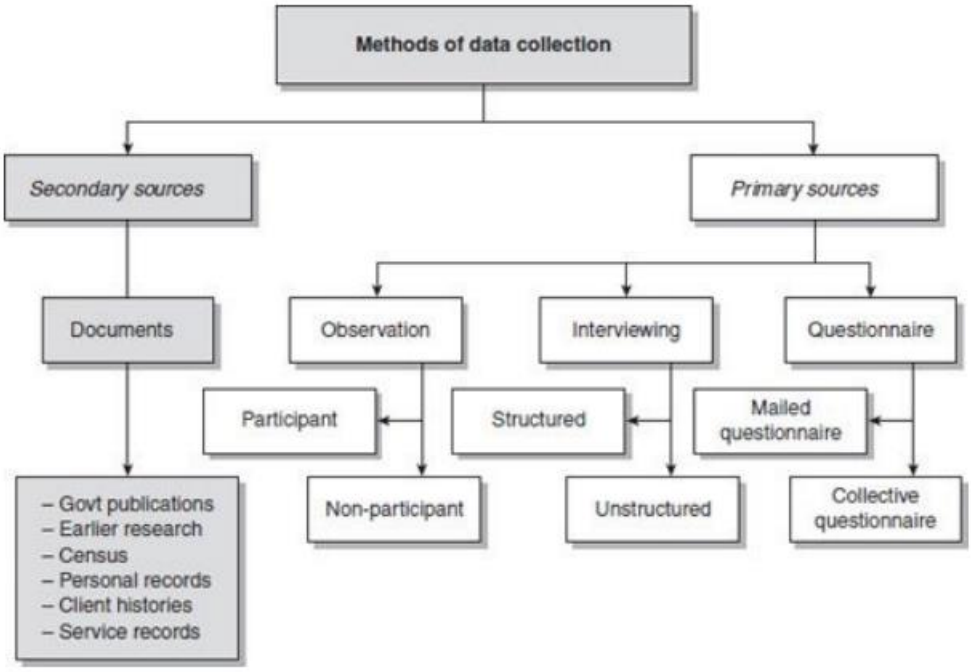


Figure 3.4: Methods of Data Collection

Source: Kumar & Ranjit, 2011

In this research, primary data will be used to obtain the required data. While observation and interview are both relevant to qualitative method, questionnaires are a common tool to collect data in quantitative research. A questionnaire consists of a set of questions provided to be answered by the respondents. When a questionnaire is given to a respondent, s/he first reads the questions, then interprets what is expected, and then writes down the answers (Kumar & Ranjit, 2011). According to (Saunders et al., 2009), there are two types of questionnaires including self-administrated and interviewer administrated. Self-administrated questionnaires are distributed in the forms of internet, postal and delivery and collect questionnaires. Interviewer-administrated questionnaires can be found in two forms of structured interviews and telephone questionnaire (refer to Figure 3.4).

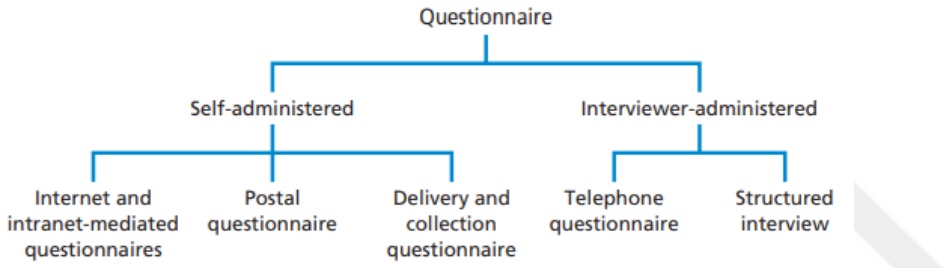


Figure 3.3: Types of Questionnaires
Source: Mark Saunders 2009, p 363

In this study, self-administrated, internet-mediated questionnaires will be disseminated among business management students to determine their sustainable entrepreneurial intention. To collect data, a consent letter will be requested from university to allow the researcher to visit public universities in Türkiye and Pakistan and find suitable respondents.

3.5. Sampling and Population of the Study

3.5.1. Unit of Analysis

Determining the unit of analysis of the research has a pivotal role in any research endeavor. According to (Dolma, 2010), the term unit of analysis can be simply defined as “the entity that is being analyzed in scientific research”. The unit of analysis can be individual, group or organizational level. In this study, the unit of analysis is individual

because the focus of the study is to examine the opinion and attitude of students toward sustainable entrepreneurial intentions.

3.5.2. Population and Source of Data

In quantitative research, population refers to the general group of interest. The individuals or organizations that compose the population generally have the same features(Clark & Creswell, 2015). The main goal of a quantitative study the generalization of results; though, the researcher cannot do the research on all members of the population one by one (Khalid et al., 2012). Therefore, a part of the population must be selected for an investigation which is called sample.

In this study, a questionnaire survey responses will be collected from the students in one private and one public university in both Pakistan and Türkiye (Jamal, 2021). University students are chosen because encouraging students to be sustainable entrepreneurs can contribute to solving social problems and helping underprivileged people (Ip et al., 2017). Additionally, governments failed to provide jobs for all the graduates (Otache, 2019) which necessitate to promote entrepreneurship to be self-employed. It is assumed that if young people are exposed to the theories and practices of sustainable entrepreneurship in university, great changes will happen. In case the students, who are equipped with knowledge and skills, are supported as well by an entrepreneurial culture and environment while living in campus, some of them may select to be a sustainable entrepreneur after their graduation (Chengalvala & Rentala, 2017).

Moreover, the current study will only focus on public universities in Lahore and Istanbul as they embrace a large portion of students.

3.5.3. Determining Sample Size

In all empirical studies, the question of how to determine sample size is a significant challenge. Sample size, in turn, determines how to make inference about the research population from a sample (Taherdoost, 2017). This construct specifies how many participants should take part in research (Clark & Creswell, 2015). It is of high importance to appropriately calculate the sample size to minimize the probability of errors (Martínez-Mesa 2014). The best sample size for certain research is dependent on several factors, e.g., the overall population size, the number of variables considered,

and the type of research questions. This causes the proper sample size to differ for different research designs (Clark & Creswell, 2015).

Regarding how to determine the minimum sample size for a particular study, Cohen (1992) suggested that it depends on the maximum number of arrows that point at a latent variable as indicated in the model. The guidelines are presented in Table 3.2.

Table 3.2: Sample size Determination

Maximum Number of Arrows Pointing at a Construct	Significance Level											
	1%				5%				10%			
	Minimum R^2				Minimum R^2				Minimum R^2			
	0.10	0.25	0.50	0.75	0.10	0.25	0.50	0.75	0.10	0.25	0.50	0.75
2	158	75	47	38	110	52	33	26	88	41	26	21
3	176	84	53	42	124	59	38	30	100	48	30	25
4	191	91	58	46	137	65	42	33	111	53	34	27
5	205	98	62	50	147	70	45	36	120	58	37	30
6	217	103	66	53	157	75	48	39	128	62	40	32
7	228	109	69	56	166	80	51	41	136	66	42	35
8	238	114	73	59	174	84	54	44	143	69	45	37
9	247	119	76	62	181	88	57	46	150	73	47	39
10	256	123	79	64	189	91	59	48	156	76	49	41

Source: Cohen, 1992

In this study, since in the proposed research framework in chapter 2 there are eight arrows pointing to sustainable entrepreneurial intention dependent variable, the minimum sample size with 1% significance level is 238. Although SEM-PLS has been proved to be able to handle small samples, the researcher's goal should not be merely to meet the minimum sample size (Arifin, 2023). To calculate sample size through a better estimation procedure and to get a larger sample size considering quite large population of students, the sample size is calculated through the PLS SEM model criteria the ideal sample size of the present study is close to 390.

3.5.4. Sampling Strategy

Through the sampling process, a few samples are selected from among a bigger group (i.e., the research population) to estimate or predict the pervasiveness of an unknown piece of information, condition, or outcome with regard to the population. In other words, sample is in fact a subgroup of the population in which the research is being

conducted(Kumar & Ranjit, 2011). As it is indicated in Figure 3.6, sampling techniques are divided into probability and non-probability sampling (Taherdoost, 2016).

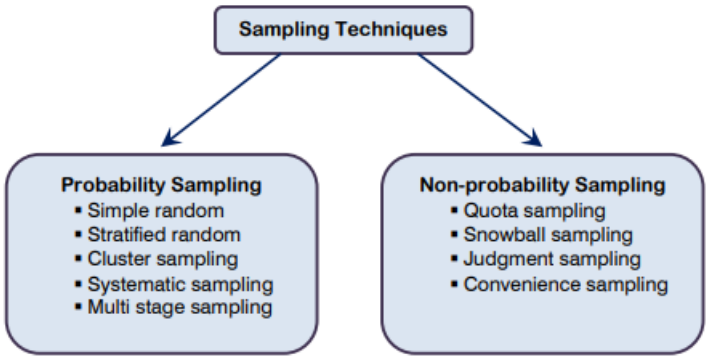


Figure 3.4: Sampling Techniques

Source: Taherdoost, 2016

In probability sampling (also known as random sampling), every single item from the universe has an equal chance to be selected as the sample (Etikan, 2017). On the other hand, nonprobability to cases in which the researcher chooses individuals based on their availability, convenience, meeting some criteria, and/orhaving features interesting to the researcher(Clark & Creswell, 2015). Random, cluster, systematic and multistage sampling is under probability of sampling. Quota, snowball, judgmental and convenience sampling are relevant to non-probability sampling (Taherdoost, 2016). In judgmental sampling, the process of selecting the samples depends on the researcher's judgement about who can make available the most needed information for achieving the research objectives. The researcher requires to be concentrated on the individuals who possess the information needed and, at the same time, are willing to share it (Etikan, 2017).

This study follows judgmental sampling because students are selected strategically to ensure that selected students can provide key insights for the research questions. Only last year undergraduate and postgraduate students will be invited to take part in this study because they are facing career choice in the near future and will enter market very soon.

3.6. Measurement items

As part of rigorous data collection, detailed information is provided regarding the actual survey applied to the current research (Creswell & Creswell, 2017). The following sections introduce the scales that are used to measure proposed variables in this study.

3.6.1. Measurement item for Perceived Barriers

Theoretical definition*:* Perceived barriers can be defined as the extent to which people consider the difficulties in starting sustainable entrepreneurship (Shahverdi et al., 2018).

Operational definition: A multidimensional phenomenon referring to the factors that hinder sustainable entrepreneurial activities among students. In present research, the dimensions of perceived barriers include financial barriers, limited training and education, lack of skills and experience, lack of awareness and lack of support. The details of these dimensions are described in the following subsections.

Table 3.3: Items to Measure Perceived Barriers Towards Sustainability

Modified Questions	References
Lack of initial capital prevents my sustainable entrepreneurial activities.	(Jha et al., 2018) (Gill et al., 2011) (Giacomin et al., 2011) (Ashour, 2016)
It is difficult to obtain finances to start a sustainable venture.	
There is much awareness about the importance of sustainable entrepreneurship.	
I feel I am hindered by a lack of entrepreneurial training.	
I suffer from a lack of available assistance in assessing business viability.	
I feel I am hindered by a lack of entrepreneurial competence.	
I cannot afford the start-up costs of a sustainable venture because of the lack of assets.	

3.6.2. Measurement item for Attitude Toward Sustainable Entrepreneurship

Theoretical definition: Attitude is a point of view that indicates the overall tendency of a person towards the object, belief or entity. Attitudes may take different forms including favorable, negative, neutral (Sawangchai et al., 2022).

Operational definition: In this study, attitude toward sustainable entrepreneurship refers to the degree in which students have undesirable or desirable evaluation about sustainable entrepreneurship as a future career.

Table 3.4: Items to Measure Attitude Toward Sustainable Entrepreneurship

Modified Questions	Refference
If I had the opportunity and resources, I would like to start a business.	(Liñán & Chen, 2009)
I believe I can identify new business opportunities for sustainable change.	
Among various options for business ventures, I would prefer to be a sustainable entrepreneur.	

3.6.3. Measurement items for Subjective Norm

Theoretical definition: Subjective norm refers to the extent to which individuals feel that they can tap into support networks (Hockerts, 2015).

Subjective norm is defined as respondents perceived social pressure from informal networks such as family, friends and lecturers to show sustainable entrepreneurial behavior.

During the data collection, respondents are asked to indicate the level agreement on a 5-point Likert scale from one (strongly disagree) to five (strongly agree). A sample of items is:“If I decide to create a social venture my family will support my decision”. All the items are described in Table 3.4.

Table 3.5: Measurement items For Subjective Norms

Modified Questions	Reference

If I create a sustainable venture, my family will support my decision.	(Liñán and Y.-W. Chen, 2009)
My close friends will support me in establishing a sustainable venture.	
If I plan to set up a sustainable venture, my teachers will praise that decision.	

3.6.4. Entrepreneurial self-Efficacy

Theoretical definition: It implies an individual's belief about his/her capabilities for contributing towards social problems (Ghatak et al., 2020).

Operational definition: the degree in which individuals believe in their own skills and capabilities to become a sustainable entrepreneur.

All the items presented in Table 3.5, are adapted/adopted from the literature. A 5-item scale is adapted from (Bacq and Alt, 2018)and four items are adopted from (Hockerts, 2015). Students are asked to indicate their level of agreement with the following statement on a scale ranging from strongly disagree to strongly agree.

Table 3.6: Measurement Items for Entrepreneurial Self-Efficacy

Modified Questions	Reference
Being a sustainable entrepreneur implies more advantages than disadvantages for me.	(Bacq & Alt, 2018a) (Hockerts, 2015)
A career as a sustainable entrepreneur is attractive for me.	
I have the potential to create new products/services to solve sustainable problems.	

3.6.5. Measurement item for Sustainable Entrepreneurial Intention

Theoretical definition: Sustainable entrepreneurial intention refers to the desire to pursue a sustainable mission by starting and running a sustainable venture (Bacq & Alt, 2018b).

Operational definition: sustainable entrepreneurial intention refers to the degree in which students are committed and interested in establishing a sustainable l venture.

Table 3.7: Items to Measure Sustainable Entrepreneurial Intention

Modified Questions	Reference
I have a strong intention to start a sustainable venture in the future.	(Urban & Kujinga, 2017)
I think I have strong entrepreneurial intentions.	
I think I will pursue entrepreneurship if there is an opportunity.	

3.6.6. Demographic Questions

The participants are required to answer questions about gender, age, year of study, education level and marital status. The following questions will be asked in order to gain a better understanding about participants' profile.

Demographics

1. Gender

a) Male b) Female

2. Age

a) 18-24 b) 25-34 c) 35-44 d) 45 above

3. Marital Status

a) Single b) Married

4. Education level

a) Undergraduate b) Master d) PhD

5. Status of the University

a) Private b) Public

6. Institute Country

a) Pakistan b) Türkiye

General Preference Questions:

7. Are you working as an entrepreneur?

a) Yes b) No

8. Are you working with someone for any type of entrepreneurial venture?

a) Yes b) No

9. With the Economic and Education Environment of the country what you will prefer to do.

a) Job b) Business

3.7. Pilot Test

Before any data collection, the questionnaire should be sent to a group of experts to ensure content and face validity, which is called pre-test. This step involves many studies to assure the straightforwardness of the questions and to make sure that the questionnaire can be completed easily by respondents. Then, the questionnaire can be revised to eliminate any problem that may emerge later (Rowley, 2014).

For pilot test, a maximum sample size of 40 is adequate to provide accurate results ((Hertzog, 2008). The pilot test will help to test the reliability of the selected items and ensure that the questionnaire has acceptable reliability. Accordingly, a questionnaire will be distributed among 40 students in private and public universities that are in Istanbul and Lahore.

3.8. Data Analysis

3.8.1. Structural equation Modelling (SEM) and Justification of Selection

Structural equation modelling (SEM) is not a single statistical technique; rather, it involves a family of interrelated processes. Other terms, for instance, covariance structure modeling or covariance structure analysis, in fact categorize these techniques together under a single label (Kline, 2011). SEM can be classified into two separate approaches: partial least squares SEM (PLS-SEM) and covariance-based SEM (CB-SEM). Many scholars consider SEM as an equivalent to performing CB-SEM analyses by means of some software, e.g., Mplus, LISREL, and Amos. But SEM also needs to be thought of as including another unique and very useful approach called PLS-SEM (J. F. Hair et al., 2011). Based on the guidelines that are presented by (Rigdon et al.,

2017) and (Hair et al., 2011)this study applies PLS-SEM approach because it aims to predict dependent variables by assuming a set of independent variables. In contrast, CB-SEM approach focus on theory testing or confirmation. Additionally, PLS-SEM can work effectively with increased model complexity and minimum sample size. Lastly, PLS-SEM does not presume that the data are normally distributed. Hence, both normal and non-normal data can be effectively run with PLS-SEM.

After selecting between PLS and CB approach, it is also important for researchers to distinguish between reflective and formative constructs. In case the latent variable can be thought of as the cause of the observed measures, this is known as a reflective model. The construct cannot be measured directly; although, it exists independently of its effect indicators (Simonetto, 2012). Reflective indicators are signified as single headed arrows that point from the latent construct towards the indicator variables. On the other hand, formative indicators are characterized by single-headed arrows that point towards the latent construct inward from the indicator variables (J. F. Hair et al., 2011). A comparison between formative and reflective models is given in Figure 3.6.

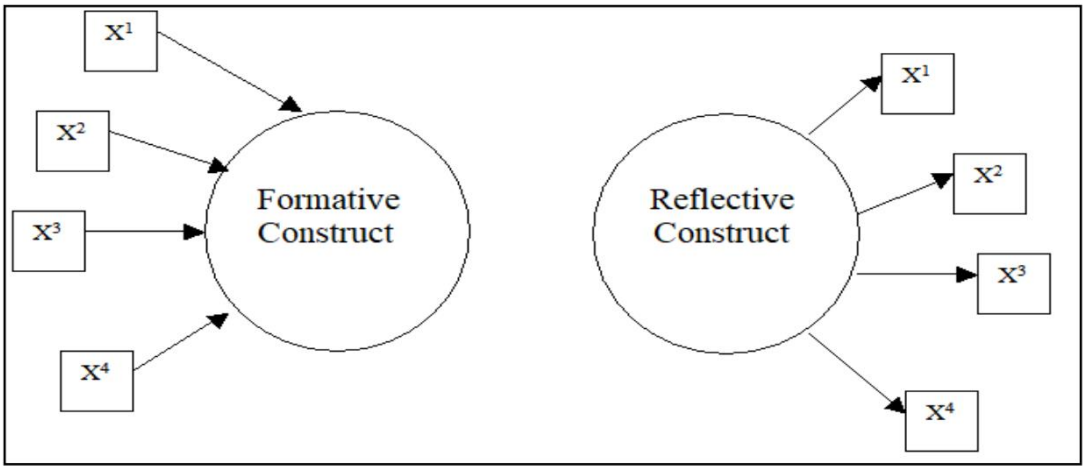


Figure 3.5: Reflective and Formative Model

Source: Hanafiah, 2020

In reflective models, indicators are interchangeable and removable. As a result, as long as there are adequate indicators, no change would not occur to the model interpretation. However, in case of formative models, for the removal of one or more observed measures that are conceptually the most critical factors in the latent construct, there is a need for the removal of a certain aspect of the construct; therefore, the composite indicators cannot be removed or used interchangeably (Simonetto, 2012; Hanafiah,

2020). Note that in the current research, the constructs are reflective since all of the items are interchangeable, highly correlated, and also could be removed without any change to the construct meaning.

3.8.2. Measurement model

For model assessment in SEM-PLS, a two-step approach is generally used for the assessment of any conceptual model. At the first step, the measurement model is assessed; then, the structural model is assessed (Al-Emran et al., 2019). In case of reflective measurement models, the assessment should be applied to Indicator reliability, Internal consistency reliability, Discriminant validity, and Convergent validity.

In first step, the researchers ensure that the measures or observations are reliable. Reliable means that scores from an instrument are stable and consistent (Clark & Creswell, 2015). For internal consistency reliability, using composite reliability is suggested. By using composite reliability, PLS-SEM can accommodate various indicator reliabilities (i.e., differences in the indicator loadings) and also it can avoid the underestimation accompanied with Cronbach's alpha (J. F. J. Hair et al., 2014). The values of composite reliability and Cronbach's Alpha typically range between "0 and 1": the higher value, the more reliable the levels are. Note that in an exploratory study, 0.60-0.70 are considered acceptable values, whereas in other types of study, 0.70-0.90 are considered acceptable (Al-Emran et al., 2019). For indicator reliability, outer loadings should be assessed. Support is provided for indicator reliability when each item has outer loadings 0.70 and above (J. F. J. Hair et al., 2014).

In the second step, the researchers ensure that the measures or observations are valid. After reading about the instruments applied to quantitative research, you need to seek information regarding the validity of the scores obtained by each instrument. Validity here refers to a state that the scores returned finally by a certain instrument accurately indicate exactly the measured variable and make the researcher capable of effectively interpreting the information (Clark & Creswell, 2015). From a technical perspective, to achieve discriminant validity, a test should not be correlated too highly with measures from which it is supposed to differ. In SEM-PLS, the most adopted approaches to the evaluation of discriminant validity are the use of Fornell-Larcker criteria and the examination of cross-loadings (Henseler et al., 2015). Regarding the cross-loadings, the outer loading of an indicator on the related construct needs to

exceed all its cross-loadings (i.e., its correlation) on other constructs. About the Fornell-Larcker criterion, it makes a comparison between the AVE values square root and the latent variable correlations (Al-Emran et al., 2019). Average Variance Extracted (AVE), which is attained through averaging the indicator reliabilities of a construct, can be used to measure the convergent validity. AVE is essentially applied to measuring the average variance that is shared between the construct and its individual indicators. In this measurement, the criterion is that the obtained value should not be less than 0.5 (50%) (J. F. Hair et al., 2020).

3.8.3. Structural model

After measurement model assessment, structural model needs to be checked whether it can reflect the connections (paths) between the latent constructs (J. F. Hair et al., 2011). According to Hair (2014), structural model can be assessed with four criteria, i.e., Coefficient of determination (R^2), Effect size (f^2), Cross-validated redundancy (Q^2), and Path coefficients.

Coefficient of determination (R^2), which measures the predictive power of a model (Al-Emran et al., 2019), is extensively applied to the assessment of structural models. When,in a structural model, the R^2 values of 0.25, 0.50, or 0.75are obtained for endogenous latent variables, the values can be translated to weak, moderate, or substantial, respectively (J. F. Hair et al., 2011).On the other hand, Cross-validated redundancy (Q2) assesses the predictive relevance of an inner model(J. F. J. Hair et al., 2014). The Q2 values that exceed 0 are considered meaningful, while the values smaller than 0 reflect the absence of a predictive relevance. Moreover, the values greater than 0.25 and 0.50 signify the medium and large predictive relevance of the PLS-SEM model (J. F. Hair et al., 2020).

Researchers generally use Bootstrapping in order to evaluate the significance of path coefficients. The number of bootstrap samples must be at least 5,000, and the number of cases needs to equal the number of observations within the original sample. In a two-tailed experiment, the critical t-values are 1.65 (significance level = 10%), 1.96 (significance level = 5%), and 2.58 (significance level = 1%) (J. F. Hair et al., 2011).The effect size (f^2) is another element that is used to assess the predictive capability of a structural model. Thef^2value is in fact an estimation of the predictive capability of each of the independent constructs within the model (J. F. Hair et al., 2020). Thef^2 values are generally ranked as either small (values above 0.02 and up to

0.15), medium (values of 0.15 and up to 0.35), or large (values 0.35 and above) (Cohen, 1988).

All the analyses for PLS-SEM can be conducted by using the SmartPLS software package as suggested by (Hair et al., 2011). Therefore, two software are used in this study including SPSS (for data screening purpose only) and SmartPLS (for data analysis).

3.9. Summary

This chapter provided a comprehensive guideline on research methods which is suitable to answer research questions outlined in chapter 1. It was discussed that this study follows positivism paradigm and quantitative method. Then, the research process and design were elaborated in detail. Next, data collection procedure was discussed along with sampling and population of the study. Lastly, scales to measure research variables were presented followed by data analysis method. It was mentioned that structural equation modeling-partial least square (SEM-PLS) is suitable for data analysis. SPSS and Smart-PLS are considered as right choice for data screening and running the model with two steps, measurement model and structural model.

CHAPTER IV

CONVENTIONAL AND ISLAMIC APPROACHES OF SUSTAINABLE ENTREPRENEURSHIP

4.1. Introduction

This chapter will show the conventional and Islamic approaches of sustainable entrepreneurship with detailed information. Traditional methods take guidance from theories like stakeholder, triple bottom line, and ESG practices. In contrast, Islamic viewpoints derive principles of sustainability from either the Quran, Sunnah or divine sources. This chapter looks at both systems, their foundations, ethical orientations and operational systems. This chapter analyzes the similarities and differences between traditional and Islamic approaches to sustainable entrepreneurship.

4.2. Conventional Insight of Sustainable Entrepreneurship

Combining entrepreneurial principles with a focus on sustainability brings a new concept, i.e., a Sustainable Entrepreneur (Rosário et al., 2022). The classical economic functions of entrepreneurs are integrated into this approach with attention to the ecological and social dimension. Sustainable entrepreneurship is an innovative business activity which does not only aim at achieving profit but also securing social justice and environmental sustainability while making profit (Schaltegger & Wagner, 2011). This change is seen in global business as they become more sustainable and believe in Corporate Social Responsibility. The reasons for this change are consumer awareness, regulations and resource constraint.

Sustainable entrepreneurship refers to the actions of entrepreneurs that integrate economic, environmental and social values (Shepherd & Patzelt, 2011). These entrepreneurs have the dual objective of fulfilling their own self-interests and contributing to the sustainable development of society at large. Here's an overview based on the literature.

4.3. Double Bottom Line

The double bottom line (DBL) refers to the idea of benefiting consumers and producers at the same time. In the early 2000s, John Elkington coined the term ‘double bottom line,’ who is also the author of the triple bottom line (TBL) (Elkington, J., 1997). The term “double bottom line” was coined by Elkington which laid emphasis on businesses

to make money and satisfy their above. According to him, businesses can create social or environmental values as well as financial return. And this needn't be mutually exclusive. In recent years, since Elkington's initial proposition, the double bottom line has gained traction as a popular framework for assessing a business. Socially responsible companies and impact investors use it to measure their performance not just financially. The double bottom line (DBL) refers to a business goal of meeting social, environmental, and financial-performance targets (Battilana & Lee, 2014). It measures a company's success not only with respect to profitability but also in terms of social and environmental matters.

A double bottom line approach is commonly used by social enterprises, impact investors, and not-for-profits. The concept states that a business can make money while having a positive social and environmental impact. The double bottom line first emerged because companies used to believe making profits was the only thing that mattered. As society became increasingly aware of social and environmental challenges, stakeholders began demanding greater accountability and transparency from businesses, including consumers, investors and employees (Santos, 2012). The double bottom line approach calls on organizations that the impact of its decisions on the environment and people matter (not just financial profitability), i.e. damaging the environment must not be profitable, nor the sufferance of the people! Impact investors and socially responsible businesses often use DBL to assess the social or environmental impact of their investments or operations.

The financial bottom line of a business is still important as it provides the liquidity required to run the business effectively and invest in initiatives crucial for society and the environment. However, the double bottom line acknowledges the societal battery of the earth in a company's actions as well as environmental. So, it asks businesses not to just earn profits but to be responsible for their impact.

Businesses using double bottom line approach can measure their social and environmental impact in either quantitative or qualitative measures such as carbon footprint, social impact etc. They may also want to share their efforts towards certain sustainability goals, for instance reducing waste or improving their workforce's diversity and inclusion (Neck et al., 2009). Double bottom line means the profit of a business plus the value of their social and environmental impact.

4.4. Triple Bottom Line

The triple bottom line (TBL) adds a third bottom line of environmental sustainability to the concept of a double bottom line. TBL measures how well a company performs socially, environmentally and financially. The (Elkington, 1997; Savitz & Weber, 2006; Hubbard, 2009) explains that companies must now think about not only making profits but also their impact on people and planet as well. Sustainable entrepreneurship is heavily reliant on this. It shows the need to harmonize and integrate economic, environmental, and social impacts with three pillars of sustainability. The objective is to create a sustainable business model that benefits all three and creates value beyond the financial sphere.

The three Ps People, Planet, Profit commonly refer to the triple bottom lines of TBL. The lower line of people includes employees, communities and more human rights, social and ethical concerns. (Nikolaou & Tsalis, 2020; Jain & Winner, 2022) The planetary bottom line includes environmental problems such as resource depletion, pollution, and climate change. The profit bottom line, like the double bottom line, refers to financial performance.

When companies adopt the TBL, they start to appreciate the value of looking at their operations in a holistic way and considering the many trade-offs and synergies that can exist (Savitz & Weber, 2006). Putting money into things like renewable energy sources or reducing waste can help the environment. Not only that, it can also boost the bottom line. It creates a social impact when businesses put in resources for training their employees and community work. What's more, it could improve financial performance too, such as in productivity and customer loyalty (Naguit, 2018).

TBL is adopted by companies that are socially responsible, sustainability reporting initiatives and impact investors. The World Business Council for Sustainable Development (WBCSD) developed this complex system that assists businesses in evaluating the impact their operations have. We can divide the TBL into three parts – economic, social and environmental. The TBL economic aspect parallels the Islamic Maqasid al-Shariah in meaning and emphasizes profit maximization, company expansion and economic progress (Azwa et al., 2023; Jaiyeoba et al., 2025). However, this dimension is also related to social and environmental objectives, for example, creating jobs and sustainable economic development that benefit everyone in society. The social aspect of TBL shows that social welfare is the main goal of any Islamic

finance activities and products. This dimension promotes social justice. It also seeks to reduce poverty. Moreover, it provides basic needs like food, shelter, and healthcare. It also contains aiding of education, social mobility and community building. The TBL's environmental dimension is viewed as significant in Islamic finance since protecting the earth is deemed a religious duty in Islam(Azwa et al., 2023; Naguit, 2018).

This dimension includes promoting sustainable practices that reduce waste, pollution, and other environmental hazards, and support the protection of natural resources for future generations.

In addition, the short key points are as follows:

- Economic: growth, revenue, under employment (Cost)
- Social: trade (Fair) charitable contribution, Employe welfare
- Environment: Use (Land), Management, Consumption

TBL can be a tool for reporting on sustainability, helping businesses to assess and manage social and environmental risks and opportunities. TBL assesses companies on three types of value while DBL assesses companies on two types of value. DBL places more emphasis on social or environmental impact rather than financial profitability.

4.5. Integration of Sustainability Goals:

Current entrepreneurial models emphasize the integration of environmental, social, and economic objectives within business processes (Moiceanu & Anghel, 2024). This approach aligns with the Sustainable Development Goals (SDGs) and encourages businesses to adopt practices that not only support economic growth but also generate positive outcomes for society and the environment (Hjorth & Holt, 2016).

According to (Crecente et al., 2021), Sustainability is linked with entrepreneurship using the global development framework of the United Nations (UN), 2030 Sustainable Development Goals (SDGs). Examine essential trends of entrepreneurship including sustainable entrepreneurship. According to the findings in the above figure, the SDGs have led the European economies to a more responsible behavior of society, institutions and their business fabric towards climate change and a new sustainable entrepreneurship. Using the indicators provided by Eurostat (Sustainable development indicators), a dataset of 21 variables has been constructed for the European Union

(EU27E) for the period 2013−2017. The author illustrates how a drive towards the SDGs has resulted in a ramping in the rate of entrepreneurial activity between 2013 and 2017. The figure below demonstrates how sustainable business objectives, and the SDGs are linked.

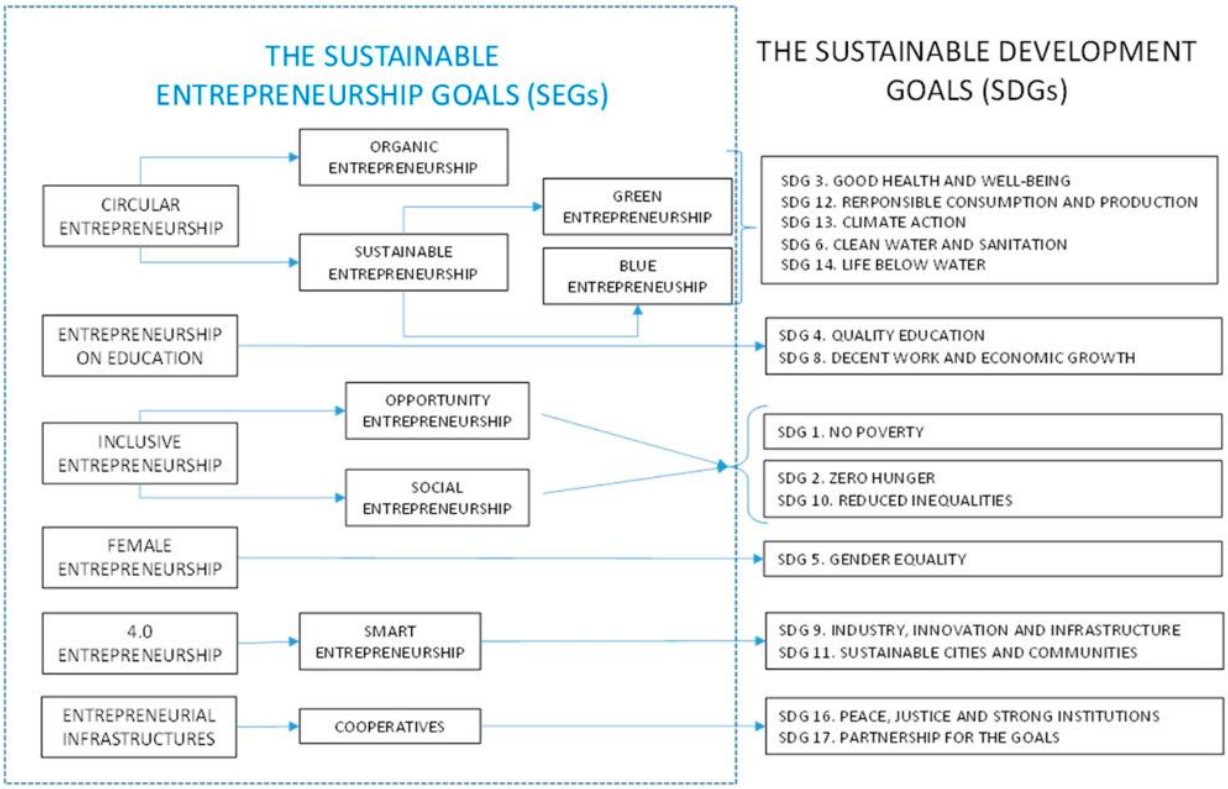


Figure 4.1: Sustainable Entrepreneurship Goals

Source: Crecente et al., 2021

4.5.1. LNOB: Leave No One Behind

The 2030 Agenda for Sustainable Development vows to not leave anyone behind while implementing the Sustainable Development Goals (SDGs). This entail catering to the needs of vulnerable nations and groups in society like those who live in poverty, and disable people, and migrants(Hansen & Wyman, 2021). All 17 Sustainable Development Goals (SDGs) and their respective targets have been framed with the aim of making SDGs a living reality for all and not just limited to a part of society and Leave No One Behind (LNOB) is a key principle of the 2030 agenda that supports these objectives. The benefits of Development must reach every person, especially the most vulnerable, marginalized and disadvantaged individuals (United Nations, 2015).

Inequalities still exist between regions and within countries and as a result various forces such as globalization, technological advancements, and climate change are further marginalizing peoples and countries(Azis Ibrahim, 2021; Hansen & Wyman, 2021). Delivering the 2030 Agenda will require holistic and coherent policies supported by data and evidence-based policymaking, as well as a transformation of deep-rooted economic, social and political systems at all levels.

In rambunctious entrepreneurship, LNOB creates inclusive, equitable and socially impactful enterprises also brings importance in new formats. Entrepreneurs are asked to create products, services and business models that help low-income communities, people with disabilities, the rural population and minorities fully participate in economic and social life.

Sustainable entrepreneurs who practice Leave No One Behind often target market gaps ignored by mainstream business, especially having affordable, accessible and environmentally sustainable solutions. Rural areas can attract low-cost health or education innovations by developing agri-tech/ low carbon technologies or producing green technologies.

According to (Schweikert et al. 2018), if entrepreneurs adopt the LNOB principle, this will lead to "business models that are not only economically viable but also explicitly aim to reduce inequalities and promote social inclusion". LNOB (Leave No one Behind) does not only mean 'eco-friendly' entrepreneurship rather it makes sustainable entrepreneurship hugely socially transformative by linking business success strongly with broad development goals.

4.5.2. Helping Other People Enthusiastically (HOP):

The basis of Helping Other People Enthusiastically (HOP) is to willingly do something to others in a spirit of goodwill, compassion, and enthusiasm. HOP in sustainable entrepreneurship is a business attitude where the objective is no longer making a profit, but rather, improving the society and environment (Peak et al., 2024). Unlike other enterprises where social and environmental impact is merely an ancillary objective, HOP-inspired entrepreneurs view service to humanity as the enterprises' main purpose. People take note of entrepreneurial actions that don't primarily focus on profitability but instead on the wider impact business can create on society.

The primary emphasis of sustainable entrepreneurship is not only aimed at making high economic profit but also at enthusiastically creating social and environmental values. Entrepreneurs who believe in “Helping Other People, enthusiastically” strive to solve social problems, empower the marginalized and build a green environment (Haugh, 2007; Neck & Greene, 2011). According to (Cohen & Winn 2007), success is not only measured through impacts on the balance sheet but rather how venture creation initiatives enhance the wellbeing of humanity and nature. Sustainable entrepreneurs driven by HOPs will embed empathy, compassion and a sincere spirit of service into their entrepreneurial activities. The aim is to align their business practices with the broader goals of inclusive equitable and sustainable development as expressed in the Sustainable Development Goals (United Nations, 2015).

According to (Haugh2007), “sustainable entrepreneurs respond to the identification and evaluation of a market opportunity and are also committed to serving others and fixing social problems”. This spirit resonates with the idea of pulling together to support initiatives in HOP that is, to inject this entrepreneurial energy, as cheerfully as possible in initiatives uplifting communities, preserving ecosystems. Another thing, HOP goes beyond the scope of SDGs and encourages entrepreneurs to develop a service-first mentality that does not merely see sustainability challenges as market opportunities, but as moral opportunities that require heartfelt action.

4.5.3. Holistic Theme

Sustainable entrepreneurship is a collaborative effort of various stakeholders such as corporates, educational institutions, government, communities, etc. This collaboration is essential for addressing multi-dimensional sustainability challenges and innovating new sustainable business practices with the change of the traditional business models having focus only on profit to more integrated business models that also recognize the value of environmental stewardship and social equity (Huarng & Yu, 2022; Konys, 2019; Theodoraki et al., 2022). This process not only helps individual businesses be sustainable but also helps towards the cause of global sustainability.

Building a sustainable entrepreneurial ecosystem requires a holistic approach capable of linking environmental, social and governance (ESG) dimensions. Sustainable ecosystems develop in three interrelated perspectives ecosystem configuration and evolution, system perspective and sustainability and strategic perspective. (Theodoraki, et.al 2022) See figure below 3.2.

Ecosystem design is the result of intensification of focus on lessening environmental harm and application of green economy strategies (Cohen & Winn, 2007). The adoption of circular economy models as well as impact measurement strengthen sustainability of the systems (Geissdoerfer et al., 2017). In this way, enhancing ecosystem resilience and dedication to sustainable development is critical to long-term environmental sustainability (Isenberg, 2010).

In the social facet of the ecosystem, it is important to recognize the uniqueness of local communities and culture social entrepreneurship initiatives, especially gender-inclusive ones (Audretsch & Belitski, 2017). A culture of entrepreneurship based on shared values, actor compatibility, and dynamic interaction is essential for a sustainable system (Spigel, 2017). Social innovation features co-opetition and an attitude to 3D and digital transitions to enhance adaptability and collaboration (Cunningham, Menter & O'Kane, 2018).

With respect to governance, ecosystem configuration relies on multi-level leadership structures as well as keystone actors that can effectively orchestrate ecosystem development (Theodoraki et al., 2022). The N-Helix model can be used for collaborative governance mechanisms and inclusiveness for systemic sustainability (Etzkowitz & Zhou, 2017). Governance must create conditions to manage competition and conflicting interests at a strategic level to ensure a vibrant and inclusive entrepreneurial ecosystem. Thus, building sustainable entrepreneurial ecosystems requires dynamic coordination across environmental, social, and governance dimensions, emphasizing not only economic growth but also societal wellbeing and environmental preservation.

	Ecosystem configuration and evolution	System perspective and sustainability	Strategic perspective
Environmental	- Environmental impact - Green economy	- Circular economy - Impact measurement	- EE Resilience - Sustainable development
Social	- Idiosyncrasies of local communities - Social entrepreneurship (gender, etc.)	- Entrepreneurial culture - Value system (shared values, compatibility, actors' interaction	- Coopetition - Digital transition
Governance	- Multi-level - Leadership (keystone player)	- Democracy and equality - N-helix	- Coopetitive tensions and management - Conflicting interests

Figure 4.2: A Holistic Perspective for Building and Entrepreneurial Ecosystem
Source: Theodoraki, C., 2022

4.6. Islamic Perspective of Sustainable Entrepreneurship

Islam is a complete religion, which does not only limit the life of its followers in the belief and worship of Almighty Allah, but it also speaks about many scientific aspects as well as business activities(Ahmed & Aassouli, 2022). In Islam, it is lawful for Muslims to engage in the business and entrepreneurial activities of any. The Qur'an and Hadith teach Muslims how to conduct their business and companies. Islam teaches behavior in any aspect of life.

In other words, Islamic laws very much support and encourage entrepreneurship. Islam is also known as the religion of entrepreneurship(Fahmi, 2022; Tahiri Jouti, 2019). It means the Qur'an and Sunnah of Prophets Muhammad SAW that allow and encourage Muslim entrepreneurs and entrepreneurship activity, risk and innovations (Dedeng, 2016). As per Entrepreneurship is the process of establishing a firm, designing and managing the organization with a view to offering a distinctive product, innovating on opportunity and enhancing the growth of profit. So, an entrepreneur is someone who can innovate and create something new that has value attached to it. I love this activity to make a good profit and development of the organization. The practice of Islamic entrepreneurship refers to a process that is system and practice operates business in an Islam manner. Islam instructs Muslim to perform trading and business as mentioned in the Noble Quran. Muslims were to strive to be self-reliant in

life. As mentioned in the Holy Quran: And Allah has allowed trading and forbidden usury" (Qur'an; 2:275)

And out of His mercy He has made for you the night and the day, that you may rest therein, and that you may seek of His grace, and that you may give thanks" (Qur'an; 28:73).

"And We have made the night and the day two signs, then We have made the sign of the night to pass away and We have made the sign of the day manifest, so that you may seek grace from your Lord, and that you might know the numbering of years and the reckoning; and We have explained everything with distinctness" (Qur'an; 17:12).

And certainly, we have established you in the earth and made in it means of livelihood for you; little it is that you give thanks" (Qur'an; 7:10).

In the above verses, business has been allowed, and it has also been established clearly that every Muslim should strive positively in Allah's path and seek His bounty and not sit idle and wait for the gift to come nor depend on someone else. A Muslim should strive for economic progress in his life. Thus, you should follow the rules/process of Noble Qur'an and Sunnah of Prophet Muhammad (PBUH) while doing anything. Muslims must maintain equilibrium while dealing and relating with the others in their living of Islam. According to (Dedeng, 2016), Islamic entrepreneurship is measured by benefits, not just the attainment of objectives. The Qur'an and Sunnah of Prophet Muhammad (SAW) are, for all Muslims, always the measure and reference of the entirety of their lives including in entrepreneurship. Muslim entrepreneurs should be cautious about their business dealings and conducting their business relationship with others in the right way by putting good faith, upholding in honesty, avoiding untruth, and never taking needless oaths in relation communication.

4.6.1. Key Principles of Islamic Sustainable Entrepreneurship

4.6.1.1. Halal Practices

We ensure our dealings and all our activities, whether in our business or in the way we live our day-to-day life do not involve doing anything against Islamic law (Salleh, 2010). For example, we provide halal meat and do not involve ourselves in usury (riba), gambling and selling or designing any non-halal goods, such as wine and pork.

4.6.1.2. Maqasid-al-Shari'ah (Objectives of Islamic Law)

This framework aims to protect five essential values: religion, life, intellect, lineage and property. In it, by entrepreneurship, we mean doing business in ways which protect our earth, resources, environment, itself and other forms of life on the earth in a sustainable manner which will be beneficial for all.

4.6.1.3. Social and Environmental Responsibility

Making business better by serving social justice, environmental sustainability and community development. This means that such needs as reducing poverty, providing educational opportunities and a clean environment are reflective of the SDGs.

4.6.1.4. Innovation and Value Creation

We must ensure that creativity and innovation are encouraged within the framework of Islamic ethics to fulfill modern society's needs.

Halalpreneurship refers to the Muslim entrepreneurs who run their business according to Islam. Muslim entrepreneurs have such wonderful characters and attitude, thus they become the earth's steward which gives substantial contribution to the surroundings. (Sardar et al., 2021). To learn more about how Islamic values can be applied in sustainable business, you refer to the discussion on Halalpreneurship, which conforms to Shariah in addition, a thoroughly reviewed depth study of Islamic economics can reveal the relevance of sustainable business.

Sustainable entrepreneurship consists of the approaches taken by entrepreneurs in Islamic perspectives to promote socially responsible use of the environment. The Islamic teachings and principles have shaped these approaches which aim to maximize the welfare of business firms and sustainability.

4.6.1.5. Adherence to Shariah (Islamic Law)

Business activities must be conducted according to Islamic law prohibiting usury, exploitation, and other unethical practices including the production or sale of haram (unlawful) goods and services.

4.6.1.6. Emphasis on Social Justice

Sustainable Islamic entrepreneurship which emphasizes social equity. It refers to business activities that promote justice. Such business activities must not be harmful to society. This involves treating employees fairly, providing them a good working

environment, teaching regarding Khalifah necessitate that entrepreneurs do investments that are more than just profit-making, they must also protect the environment and conserve nature. This includes initiatives like waste, pollution control, and sustained resource management.

4.6.1.7. Ethical Wealth Creation

According to Islamic sustainable entrepreneurship, creation of wealth is related to the ethical aspect which means the wealth produced should be for the benefit of society. It means investing in community development projects, supporting charity work and avoiding extravagance.

4.6.1.8. Halal and Tayyib (Pure and Wholesome) Practices

In addition to compliance with Islamic law, consideration must be given to whether the product or service is Tayyib. In other words, it refers to safety in health including environmental health.

4.7. Triple Bottom Line to Penta Bottom Line

Conventional Triple Bottom Line Focuses on balancing economic, social, and environmental responsibilities. According to the Islamic Perspectives there is the addition of Participation & Partnership which emphasizes inclusive practices and collaboration among all stakeholders, ensuring that business benefits are widespread and do not exclude any community members(Ahmed & Aassouli, 2022).

Like in case of LNOB concept, businesses ensure that their sustainable practices benefit all segments of society, particularly the marginalized, aligning with both the conventional emphasis on social equity and the Islamic emphasis on community welfare and justice (Ahmed & Aassouli, 2022).

Similarly, Conventional Triple Bottom Line Traditionally focuses on maximizing stakeholder value across economic, social, and environmental spheres. While Islamic Penta Bottom Line Extends this model by adding ethical dimensions specific to Islamic law, including adherence to halal practices and ensuring all business activities are just and beneficial to society(Harahap et al., 2023). The joint method would concentrate on earning profit but without affecting justice and ethics as prescribed by the Sharia, profit achieved in favor of injustice and unethical matters is forbidden by Sharia and against Islam.

4.7.1. In the context of Maqasid al Shariah

Shariah standards benefit the society that are in a opposition to harm. The goals of Shariah seek to protect religion, life, intellect, progeny and property. The methods allow for business practices becoming Islamic by stressing on the essential integration of business, social, and economic activities. Moreover, it places focus on business's institutional responsibilities towards the society and environment.

In Islam, the triple bottom line (TBL) is like the idea of Maqasid al-Shariah, The TBL in Islamic finance includes economic, social and environmental dimensions. Different parties in society are concerned with different dimensions or objectives through the TBL in Islamic finance. The TBL in Islamic finance is relevant for the entities that operate in economic sector. The TBL's economic aspect is in line with the Maqasid al-Shariah in Islam which emphasizes creation of wealth, growth of business and economic prosperity (Dusuki & Bouheraoua, 2011; Chapra, 2008). But this dimension also relates to social and environmental objectives, such as creating jobs and helping the economy grow in a way that benefits society.

The social dimension in the TBL reminds us that social well-being is an objective of Islamic finance. This dimension refers to the promotion of social justice, the reduction of poverty, the satisfying of the basic needs of food, shelter, and health. It also has a focus on education, social mobility, and community development (Al-Qaradawi, 2010; Khan & Karim, 2018).

Islamic finance places emphasis on the environmental aspect of the TBL since protection of the environment is seen as a compliance within Islam. This dimension includes activities that advance sustainable practices in conserving natural resources that cut down waste, pollution and other dangers of the environment.

The overall view of TBL within Islam signifies how Islamic teachings lay great stress on the requirement for balancing 3 objectives- economic, social, and environmental. Islamic finance aims to promote sustainable development for present and future generations while ensuring socially responsible and sustainable practices (Siddiqi, 2004; Farook, 2008). For further understanding see the table below.

Table 4.1: Comparison of the TBL and Expanded Bottom Lines

TBL & Expanded Bottom Lines	Expanded Penta Bottom Lines	TBL & Expanded Bottom Lines
People (Social)	Adl (Justice)	Promotes social equity, ethical treatment, and fairness in business practices.
	Zakat (Almsgiving)	Encourages wealth redistribution and support for the less fortunate, enhancing social well-being.
Planet (Environmental	Khilafah (Stewardship)	Emphasizes responsible stewardship of Earth's resources, aligning with environmental sustainability.
	Tawhid (Oneness of God)	Recognizes the interconnectedness of all creation, promoting holistic environmental care.
Profit (Economic)	Qard al-Hasan (Benevolent Loan)	Supports ethical finance and social impact, aligning profit with social responsibility.
	Maqasid al-Shariah (Objectives of Islamic Law)	Ensures that economic activities contribute to overall welfare, balancing profit with social and environmental goals.
Purpose	Ihsan (Excellence in Conduct)	Encourages businesses to operate with moral integrity and ethical excellence, beyond mere profit.
	Taqwa (God-Consciousness)	Fosters ethical behavior and accountability in all business actions.

Partnerships	Shura (Consultation)	Promotes collaborative and participatory decision-making, aligning with the importance of partnerships.
Prosperity	Zakat (Almsgiving)	Ensures that economic benefits are distributed fairly, contributing to overall prosperity.
	Maqasid al-Shariah (Objectives of Islamic Law)	Guides business practices to enhance collective well-being and economic equity.
Peace	Adl (Justice)	Supports social justice and stability, contributing to peace within communities.
Circularity	Khilafah (Stewardship)	Aligns with the concept of a circular economy, emphasizing sustainable management of resources.
Maslaha (Public Interest)	Maslaha (Public Interest)	Prioritizes decisions that benefit the public good, aligning with broader sustainability goals.

4.8. BRAVE Framework for Sustainable Entrepreneurship:

4.8.1. Being Sympathetic

Sympathy forms the ethical foundation of sustainable entrepreneurship. Entrepreneurs are expected to internalize compassion, empathy, and a genuine concern for the wellbeing of others, especially underserved and marginalized groups.

Islam strongly emphasizes empathy. The Prophet Muhammad ﷺ said:

“He is not a believer whose stomach is filled while his neighbor goes hungry.”

(Sunan al-Kubrá by al-Nasā’ī, 7402)

This tradition upholds social solidarity (takaful) and prioritizing community welfare, aligning with the moral objectives of maqasid al-shariah.

In modern CSR, sympathy is translated into stakeholder care and ethical obligations. According to (Carroll 1991), ethical and philanthropic responsibilities are essential for businesses seeking long-term legitimacy and social approval.

4.8.2. Remain Involved

Sustainable entrepreneurs must maintain continuous engagement with stakeholders, communities, and ecosystems. This means not only initiating responsible practices but staying committed over time.

Islam encourages consistent good actions. The Prophet ﷺ said:

"The most beloved of deeds to Allah are those that are most consistent, even if they are small."

(Sahih al-Bukhari, 6465)

This reflects a principle of long-term commitment and involvement in causes that benefit the collective good. Effective CSR requires not one-time donations or symbolic gestures, but embedded, consistent social and environmental commitment. Strategic CSR literature emphasizes the embeddedness of social purpose in core operations (Porter & Kramer, 2011).

4.8.3. Remain Always Active

Entrepreneurs must be proactive, diligent, and consistent in applying sustainable practices. This includes continual learning, policy engagement, and monitoring environmental/social impacts.

Islam promotes striving for good (jihad bil-nafs) and upholding justice in all actions. Allah says:

"And say, 'Do [good] deeds; for Allah will see your deeds, and [so will] His Messenger and the believers'"

(Qur'an 9:105)

Sustainability in Islam is an active responsibility, not a passive ideal.

Modern sustainability literature calls for dynamic capabilities in entrepreneurs actively adapting to societal and environmental needs (Teece, 2007). This is key in fast-changing markets and ecosystems.

4.8.4. Exhibit Virtual Ethics

In today's digital world, entrepreneurs must uphold ethical behavior online in marketing, social media, data privacy, and AI-enabled tools. This includes truthfulness**,** transparency, and digital modesty**.**

The Qur'an emphasizes honesty and fairness**:**

"Woe to those that give less [than due]… but when they give by measure or weight to them, they cause loss."
(Qur'an 83:1–3)

Trustworthiness (*amana*) applies equally to virtual interactions. Islam condemns deception in all forms physical or digital.
The rise of digital sustainability stresses ethical tech use, online reputation management, and cyber ethics. Researchers call for ethical AI, fair algorithms, and green IT (Sivarajah et al., 2020).

4.8.5. Actively Share Emotion

Entrepreneurs are encouraged to be emotionally intelligent to openly share concern, care, and emotional support. This helps build trust, psychological safety, and social cohesion within organizations and communities. The Prophet ﷺ is described as gentle, emotionally aware, and caring. He said:

"The believers in their mutual love, compassion, and sympathy are like one body."
(Sahih al-Bukhari & Muslim)

This compassion-centered model promotes emotional connection as a moral virtue in leadership.
Modern leadership research emphasizes emotional intelligence (EI) as a key trait for sustainable and inclusive entrepreneurship. EI fosters healthier workplaces, ethical cultures, and more effective stakeholder relationships (Goleman, 1995).

4.9. Profit Maximizing with Justice

Justice (adl and qist) is a principal value which governs all economic and ethical behavior including profit seeking. Untraditional models put profit maximization as an end. In Islam, profit is also a means. However, it is not an end without qualification. It must lead to greater social good. Also, it must not come in a way that is unjust, discriminatory, or unbalanced.

The Qur'an asks the believers to "give full measure and full weight in justice" (Qur'an 6:153) and to "be staunch in justice, even against your own kin (Qur'an 4:135) and to do just as Allah (SWT) has made obligatory (Qur'an 57:25). These commands highlight the fact that deciding what to charge, how to allocate factors of production, how to advertise, and so on, are not morally neutral actions. Instead, all of these are ethical acts. Entrepreneurs should charge fair prices, not exploit others, and share returns fairly. All stakeholders (workers and suppliers, etc.) should get what they deserve.

In this context, justice means balance and proportion, as reflected in Qur'anic metaphors of weighing and measuring. When rights are unclear, they must balance competing interests and strike a harmonious compromise. Justice, therefore, not only means following the law, but must also mean making sensible moral judgements when claims conflict.

Thus, in Islam, profit is legitimate only when it is made by just means and there is concern for social welfare, environment and dignity of stakeholders. A profit made unjustly (through deception, monopoly, or distortion) is condemned by the shariah and will not be viable economically.

Justice not only has moral standing in Islam but also acts as a strategic concern. It ensures that profit is not obtained at the cost of people and the planet but obtained in the manner which is in harmony with Maqasid al-shariah the protection of faith, life, intellect, wealth and dignity.

4.10. Comparison of Conventional and Islamic approaches:

When comparing conventional and Islamic approaches to sustainable entrepreneurship, several key dimensions emerge that highlight both the similarities and unique aspects of each framework. These include ethical foundations, emphasis on social and environmental responsibilities, approaches to profit and wealth distribution, and stakeholder engagement strategies. Here's a professional comparison of these models, approaches, and conceptual theories:

4.10.1. Foundations of Sustainability Theories

According to conventional sustainable entrepreneurship, there are several theories that guide the concept, for example, the triple bottom line which focuses on social benefit, financial viability, and environmental protection. Ideas like Corporate Social

Responsibility (CSR) and stakeholder theory are also important, and they advocate that companies must take care of the interests of all stakeholders, and not just those of the shareholders.(Pierscieniak et al., 2023)

According to Islamic theories, which affect all aspects of life, including business, and which is derived from Shariah, sustainable entrepreneurship is supported. The main Islamic business principle and concept is that Maqasid al-Shariah (Objectives of Islamic Law). It relates to preserving religion, life, intellect, offspring, and property. The goal of these things is to ensure that business practices are conducted in accordance with norms, which in turn contributes to society's welfare.

4.10.2. Ethical Foundations

Conventional approaches emerge from secular ethics and corporate governance approaches that aim at sustainability. Some principles like transparency, accountability, fair trade, etc., should be followed to harmonize business activities with global sustainability goals like SDGs (Sustainable Development Goals).

Islamic Approaches are based on the rules of Shariah law that cover every activity including business ethics. The principles are often religious in nature, as they are linked to justice, fair play and the prohibition of exploitation (e.g., usury or riba and fraud)(Ahmed & Aassouli, 2022).

4.10.3. Economic Objectives and Practices

In the conventional realm of sustainable entrepreneurship, the economic aspect revolves around the profitability and long-term viability of an enterprise. It also integrates social and environmental matters to bolster business sustainability.

Economic practices under Islamic Approaches not only aim for profit generation but they should also fall within the purview of Islamic laws that advocate for fair dealings and prohibition of exploiting others as well as the need for contributing towards societal development through zakat.

4.10.4. Social and Environmental Responsibilities

A traditional approach focuses on the triple bottom line (people, planet, profit), which strives to balance economic growth with social equity and environmental protection. Businesses are encouraged to become more sustainable in an innovative and efficient manner while also improving their community relationships(Umar et al., 2020).

Islamic Approaches goes beyond triple bottom-line thinking to one that we may term as a Penta bottom line, which would compliance to Islamic ethical principle, participation and spiritual accountability. According to the religion, social and environmental stewardship is regarded as part of the duty of Allah (God) that is a given in recognition of the greater mission of humans as stewards of the earth (Khalifah).

4.10.5. Profit and Wealth Distribution

As profit remains the primary goal of conventional approaches, there is an increasing focus on reinvesting or distributing profit for environmental sustainability and social welfare. Stakeholder demands, corporate social responsibility strategies and regulatory frameworks usually drive this activity.

Muslim economic values hold that wealth must be earned legally, distributed according to Islam (including zakat), and not hoarded illegally. It prohibits monopoly practices that cause a jump in prices. It's all about justice and fairness in the way wealth is distributed, which must benefit the community, not just shareholders.

4.10.6. Stakeholder Engagement

Conventional Approaches for stakeholder engagement with engagement in conventional models require collaboration with various stakeholders ranging from an investor to the customer and the community and regulation to the business.

Through Islamic Approaches we understand that engagement is fundamentally from the community and guided by the principles of consultation (Shura) and cooperation.

Businesses should do what is best for everyone who is affected by the business. Stakeholders are not just the people who are directly involved in the business but also people in the community and the environment.

4.10.7. Integration of Global and Local Perspectives

When measuring the use of International Standards and Practices, there may be some challenges in local context, particularly in non-western countries or where local culture and business practices differ from global business norms.

Through Islamic Approach aligned with global sustainability objectives, they can be very local and community-oriented, rooted in the religious, social and cultural specificities of Muslim-majority countries and communities.

4.10.8. Environmental Stewardship

The conventional approaches for environmental sustainability involve compliance with international environmental standards, eco-friendly technology, and aims to reduce the carbon footprint. Nature conservation is another way Islamic environmentalism emphasizes the duty to protect creation given by Allah. The idea of Khalifah (stewardship) prompts Muslims to safeguard, conserve and enhance the environment because of a duty given by God.

4.10.9. Ethical Guidelines and Business Conduct

In conventional frameworks, the ethical guidelines are secular. Such ethical guidelines are developed from legal requirements and corporate governance directives. They promote transparency, accountability, and ethics in stakeholder dealing.

According to Islamic ethics, a business should be a source of success for the ummah. Islamic financial principles forbid certain types of practices. These include riba, which means usury, gharar, which means excessive uncertainty. Also, they prohibit haram, which means the production or sale of impermissible goods. Islamic ethics teach us not just to be truthful and honest, but also to be responsible towards the community.

4.10.10. Social Responsibilities

Conventional Approaches deal with corporate philanthropy, fair labor practices, and community engagement are examples of social responsibility in the conventional sense. It often includes more global programs and partnerships to tackle social issues like poverty and education (Ahmad et al., 2022; Rosário & Figueiredo, 2024).

In Islamic approach, being socially responsible goes beyond just giving donations or using fair means in business. It is viewed as an integral part of your faith. Being an employer, one is responsible to their employees. Similarly, animal welfare is also a responsibility that most people seem to overlook. Moreover, fair trade also ties along with fulfilling one’s duty to Allah as well as society. Most importantly, one must give back to the community.

4.11. Summary

According to the comparative analysis, while conventional and Islamic sustainable entrepreneurship have the same vision for-profit entrepreneurship that attains higher profits while being socially responsible and preserving the environment they greatly

differ in the principles and ethics they apply. According to the Islamic model, you are responsible for your actions to God, but it does not permit going at large. To sum it up, conventional and Islamic sustainable entrepreneurship frameworks have been developed in response to the rising environmental ills and need for business to be more responsible towards the people and the planet. Still, the Islamic model combines economic and non-economic considerations with a faith-based framework to provide additional layers of ethical guidance and community focus. Thus, it offers a more holistic approach to linking economic activities with spiritual and social obligations. All the models contribute ideas that are relevant to the worldwide discourse on sustainable development and entrepreneurship.

CHAPTER V

SUSTAINABLE ENTREPRENEURSHIP FOR SMES IN A GLOBAL PERSPECTIVE

5.1. Introduction:

This chapter will present the overview of the Sustainable entrepreneurship for SMEs in global perspective, Also, analyze sustainable entrepreneurship, especially evolution regarding increasingly feeling the need for socially responsible and environmentally conscious business models. Sustainability has spawned from being a fringe concept to an important pillar of the entrepreneurial strategy. This is especially true in the case of SMEs, which form the backbone of most economies. In this chapter some of the key global trends, theorization and practical ways are explored which blends profit with purpose and aims to position SMEs as active players to sustainable development goals (SDGs).

5.2. Sustainable Entrepreneurship in SMEs:

Sustainable entrepreneurship provides a framework for resolving the issues between business innovation and sustainable development. It is an entrepreneurial initiative that has either social, cultural, and environmental value as its main goal.(Avelar et al., 2024; Soto-Acosta et al., 2016a) Also, it brings profit to the investors. Since more than 90% of the businesses in most economies are small and medium-sized enterprises (SMEs), worldbank.org, their engagement in sustainability is critical for resolving global issues such as climate change and resource shortages as well as social injustice (Gopal, 2024; Avelar et al., 2024). In this part, we give a theoretical background on sustainable entrepreneurship in SMEs. Then we will have a look at key findings from some global and regional studies, especially on Pakistan and Türkiye, challenges and benefits of SMEs, policies/frameworks helping these SMEs, and the case examples of SMEs adopting sustainability.

5.3. Definition and Theoretical Background

In general, sustainable entrepreneurship in the SME context is defined as an entrepreneurial approach that incorporates the triple bottom line economic, social and environmental objectives into a firm’s core strategy and operations. In other words, it means designing the business model to create a profit while benefiting society and not

violating, but ideally restoring the environment (Ferreira & Ferreira, 2023). As recent reviews by Bischoff and Volkmann reveal, sustainable entrepreneurship involves entrepreneurial ventures with the purpose of sustainability that embeds sustainability in the firm's core business strategy and model that align ecological, social and economic goals. The all encompasses purpose is what differentiates sustainable entrepreneurs from commercial entrepreneurs (non-sustainable or not completely sustainable) who primarily focus on profit, as well as social entrepreneurs (those who basically focus on social value) or green/environmental entrepreneurs (those who primarily focus on ecological issues). Sustainable entrepreneurs, often called triple bottom entrepreneurs, are aiming to solve the three-dimensional problems together (Soto-Acosta et al., 2016b). That is often mentioned as people, planet, and profitsiciado.com. Thus, they want to meet the present wants without compromising future generations not to meet theirs. It is clearly echoed in the classic definition of sustainability by Brundtland commissionmdpi.com.

In theory, sustainable entrepreneurship draws from entrepreneurship as well as from sustainability. It is similar to entrepreneurship concerning recognizing opportunity and innovation but directed towards finding solutions for environmental or social challenges. According to academic experts, sustainable entrepreneurship expresses a combination of Schumpeterian innovation (the new combinations that change everything) with sustainable development. People starting business in sector like clean technologies, waste reduction or social inclusion, entrepreneurs actively look for market opportunities in those areas and convert global problems into business opportunities (doing well by doing good). (Avelar et al., 2024; Karunia Tunjungsari et al., 2021; Sciences & 2023, 2023) Based on shared value and stakeholder theory, sustainable SMEs create economic value in a way which also creates value in society and reduces (or enhances) impact on the environment. According to the expert, the multi-value creation logic makes sustainable entrepreneurship one possible pathway for SMEs to contribute to SDG.

Sustainable entrepreneurship has received a significant amount of attention in academia and practice for the past two decades. In the past few years, the literature

accessible has been observed to grow rapidly but what was earlier?

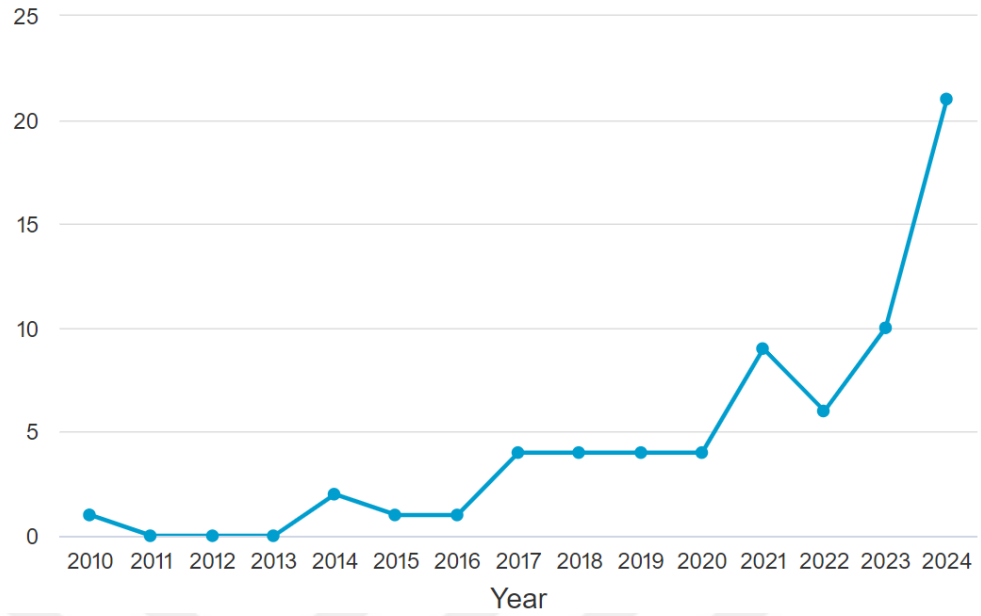


Figure 5.1: Emergence of Sustainable Entrepreneurship for SMEs

Source: Scopus Data Base, 2025

The above figure shows the rise in academic studies on sustainable entrepreneurship linked with SMES over time.

The academic interest in the field is growing rapidly. The world has been facing a lot of issues recently. Whether it is climate change, social inequality, or scarcity of resources, concern is rising around the world. Thus, in these changing times, there has also been a rise in the need for sustainable business practicesmdepi.com. Entrepreneurship has gained recognition as "central in transitioning towards a more sustainable future." mdpi.com In short, the idea of sustainable entrepreneurship promotes the innovation and growth of SMEs while protecting the environment and improving society.

5.4. Global Trends and Key Findings

Sustainable entrepreneurship in SMEs has transcended its fringe status to become a global movement. As mentioned, SMEs are the backbone of most economies (accounting for 99% of firms and a large share of employment), so their impact on sustainability is huge, world bank.org. International frameworks such as the United Nations Sustainable Development Goals (SDGs) recognize that businesses, including SMEs, can assist in tackling challenges such as poverty, clean energy, responsible production, and climate action (Khan & Badjie, 2020). The SDGs provide a

roundabout way for SMEs to conform to the globalization target in their business strategies. Small businesses can contribute to Sustainable Development Goals (SDGs) such as reducing inequalities by using-by-using principles based on their core principles. In fact, because of their ubiquity and grassroots reach, SMEs are seen as STMUDGIs crucial lit agents for SDG implementation, a point underscored by studies and surveys across various countries.

Research trends reflect this growing emphasis. Following in 2015 (country member states launched SDGs), the academic interest in sustainable entrepreneurship has undergone a steep rise in publications through the 2020s(Ferreira & Ferreira, 2023). Recent analysis of the literature confirms an increased coverage of topics within the field. These topics vary from sustainable business model innovation and the role of institutional support, and many more. It is a more holistic integration of sustainability in the "global business arena". One important finding is that collaboration and engaging stakeholders are important. Meaningful sustainability achievement often needs a network of entrepreneurs, customers, suppliers, and governments. Another insight is that small and medium-sized enterprises (SMEs) are progressively migrating towards service-oriented business models and circular economy practices in their sustainability journey (Chatterjee et al., 2022; Havierniková & Kordoš, 2019). More and more small firms are researching ways to provide service (product sharing, maintenance, etc.) or to reclaim and recycle materials instead of following the conventional linear models of produce-use-dispose, which cut down on waste and create more value at the same time.

All in all, worldwide trends show that sustainable entrepreneurship is becoming mainstreamed as a strategic choice of SMEs for innovation, competitiveness and contribution to society (Nuseir & Aljumah, 2022). Seeing all the success stories and the policy support (well go through this below), and more importantly, empirical studies show that the sustainability practice implementation by SMEs generates positive results like enhanced innovation capability, brand reputation, and long-term performance.

5.5. Challenges for SMEs in Adopting Sustainable Practices

SMEs are nevertheless faced with the adverse challenges of adapting sustainable entrepreneurship. Various studies have shown that small and medium businesses face the same barriers in 'going green' or becoming socially responsible. The lack of

financial capital, technical expertise, and human resources remain a primary challenge as the SMEs often do not have the means to invest in sustainability(Chochia et al., 2023). For example, a recent case study of Turkish SMEs found that while the majority of SMEs surveyed would prefer to adopt green strategies, they face “lack of financial and technical resources” and difficulties internalizing green practices into their business (Aysan et al., 2016).

When you’ve got little cash to spare, being able to invest in new clean tech or absorb the upfront costs of process improvements can be a challenge, even if they pay off in the long run. Just like that, SMEs may not have the expertise or personnel who can specialize in sustainability management leading to an information gap and skill gap. According to Chochia et al., 2023; Villar & Miralles, 2019, small enterprises usually do not have enough information on how to go about taking any environmental initiatives, Moreover, they do not have sufficient finance as well. A lot of SME owners are at a loss as to where they should begin or how to measure and level up their sustainability performances.

There are regulatory and market pressure as another barrier. Because of their smaller size, SMEs frequently lack the capacity to deal with complex regulations or certification processes regarding sustainability, such as environmental standards and reporting requirements. Compliance can be critical; the study mentioned in the introductory chapter reported that compliance with local and global environmental legislation was a non-trivial difficulty for smaller (Fischer et al., 2018; Shahid, 2023).

In developing nations such as Pakistan, these problems are made worse by the lack of institutions and infrastructure. According to various studies, when it comes to SME strategies, these organizations function within mechanisms which have not yet developed. In other words, they tend to have outdated structures (Farhan Jalil et al., 2022; Sher et al., 2020; Tunio et al., 2021). Additionally, they have an innovative ecosystem that is limited too. This in turn restrains the economic potential of SMEs. This can make it even harder to meet sustainability targets as they are often not afforded the same priority as basic business hurdles − access to finance, stable electricity, skilled labor which take precedence, and any additional burden of “green” compliance is seen as a cost not a necessity. A survey of manufacturing SMEs from Pakistan confirmed that scarce resources and lack of external support mitigates sustainable (Sher et al., 2020).

Many SMEs also believe that sustainability and survival, in the short run, are a trade-off. Small businesses are usually working on thin margins and only focused on daily survival and competition. Firms hesitate to invest as cleaner production, employees, or community projects do not yield quick returns. Many SME owners think they are being pressured to spend their efforts on core business operations and not on extra sustainability projects, and not least due to the lack of incentives and support (Naveed et al., 2022). Some traditional SMEs don't see the value of sustainability. Alternatively, they might think it only adds cost or is merely compliance. These attitudes make it hard to see sustainability as a strategic opportunity.

In summary, the most key barriers for SMES are financial limitations, lack of know-how, regulatory burdens; and perceived risk or uncertainty of they are worth it. This isn't too hard (Yasir et al., 2022). High-profile issue and well-documented in the literature of countries all over the world. Most of the time, we need outside help and a new point of view. Experts suggest that, despite these barriers, the SMEs must try to be as proactive as possible. Otherwise, they risk falling behind their competitors in green innovations, losing out on government incentives, and not meeting shifting consumer expectations. In coming sections will discuss how sustainability makes business sense for SMEs and what kind of supportive frameworks are in place to help SMEs along the way.

5.6. Benefits of Integrating Sustainability in SMEs

If SMEs adopt sustainable entrepreneurship practices, they can benefit increasingly by turning the challenges into opportunities. Sustainability is not just an ethical or compliance issue anymore. There is rising evidence that it makes good business sense for small firms in several ways.

5.6.1. Competitive Advantage and Market Opportunities:

Sustainability can set SMEs apart from competitors and create opportunities in new markets. SMEs that "take a proactive approach to. By being able to offer clients services that demonstrate commitment to sustainability can gain a competitive advantage and attract new clients", (Tawrat, 2023) as well as secure the long-term future of the business. Smaller businesses can serve the growing market of eco-conscious and socially conscious consumers by selling green products or responsible services. Environmental innovations often lead to efficiency and productivity

improvements which strengthen competitiveness. Consistent with this, case studies show SMEs can increase market share and customer loyalty through green strategies (Rajkamal et al., 2022). They say “need makes the mare go.” In the export market or the B2B supply chain, being sustainable is increasingly becoming a requirement to do business. Consequently, large corporations often won’t deal with suppliers who don’t have sound environmental and social credentials (Raposo et al., 2020). Thus, sustainability can be a door-opener to contracts and partnerships that could not be brought in otherwise.

5.6.2. Savings and Efficiency Cost

Sustainability steps also enhance efficiency and lower costs, which greatly benefits small and medium-sized businesses (Foucrier et al., 2019). When you reduce energy, water, or raw material use, costs go down. Use less plastic and recycle to save money and reduce your waste disposal fees. Many energy efficiency projects redeem their costs quickly; they are often “low-hanging fruit”. For example, one SME manufacturing firm in the UK installed a simple technology (variable-speed drives on its motors) which enabled it to save on energy by almost 50%, getting back payback in under six months (Ouano & Mazzarella, 2021). Such improvements directly boost profitability. Consistent energy management or lean manufacturing gradually amplifies these savings as time goes by. Additionally, to avoid additional costs or disruptions caused by future regulation (for example, carbon pricing or waste charges), SMEs can be prepared in advance. Resource efficiency essentially equals cost efficiency. Getting it right will make your business more resilient and leaner.

Brands that prioritize social responsibility gain a competitive edge over less responsible counterpart. Surveys run by Europe have shown that 94% of its citizens think that protecting the environment is essential. Moreover, most think companies must account for sustainability in their methods (Sáez-Martínez et al., 2014; Urbaniec, 2018). When small and medium enterprises show genuine commitment toward social and environmental goals (ethical sourcing, eco-friendly packaging, community support etc.), they can boost their brand image significantly. Consequently, there are more chances of generating sales from these customers. They feel like they are spending their bucks onto a responsible brand. If you’ve built a good reputation for sustainability, then it can be a strong intangible asset for an SME. It can set you apart

from the competition in congested markets, and in some cases, your premium pricing can be accepted (as some consumers will pay extra for greener goods).

5.6.3. Employee Attraction and Retention

Sustainable practices also provide human capital benefits. Companies that have a purpose beyond money are increasingly appealing to employees, especially the younger generation. According to a global study by IBM, 69% of the Workforce prefer to work for an organization which is Eco-Friendly (Tan et al., 2024). Embedding sustainability into your SME culture can enhance employee happiness and morale. It reduces turnover rates when workers take pride in contributing to a positive mission. Also, stressful values such as caring for the environment or social responsibility can help an SME appeal to a wider audience when it comes to recruiting talent. There are plenty of skilled employees who want meaningful jobs, so they can enhance their audit experience. Given that SMEs usually find it hard to compete with bigger firms on salary, a sense of purpose can level the playing field in recruitment (Ritala et al., 2017).

5.6.4. Innovation and Long-Term Resilience

Integrating sustainability pushes SMEs towards innovation. To fix environmental or social problems cost-effectively, SMEs should generally be creative. This may involve designing a new product made from recycled materials (Urbaniec, 2018a). It could also mean adopting a new business model, such as product-as-a-service. Innovation can create technologies in the niche areas of business. Thus, any innovative impulse can ensure the company is much ahead. Sustainable SMEs may be more resilient (Huang et al., n.d.; Mukesh, 2022). They will do well in the future (complying with or exceeding regulatory requirements). They also create goodwill with stakeholders (community, regulators, investors), which can come in handy in difficult times.

Reducing reliance on scarce resources and risks (e.g., supply chain disruption from climatic events) makes them less vulnerable to shocks. Studies show that SMEs whose attitude is future-ready and adaptable, owing to their focus on sustainability, are known to survive in the business (Lüdeke-Freund, 2020a; Urbaniec, 2018b). In brief, the costs of implementing sustainable practices can be substantial and beneficial for SMEs. In other words, the investment may be costly, but the returns are worth the while, both tangibly and intangibly (Hällerstrand et al., 2023). The following subsection reviews how various governments and institutions are increasingly helping SMEs to receive

these benefits, as well as what policy frameworks are available across the globe and countries such as Pakistan and Türkiye.

5.7. Supportive Policies and Frameworks

Many global policymakers and organizations have introduced frameworks to help SMEs with sustainable entrepreneurship, recognizing the significance of SME sustainability and the challenges involved. They can range from international to national policies and programs.

5.7.1. Global and International Frameworks

The UN Sustainable Development Goals (Goal 8 on decent work and economic growth, Goal 9 on industry innovation, Goal 12 on responsible consumption/production, etc.) provide, at the broadest level, guiding objectives through which countries are encouraged to create sustainably focused enterprises. Organizations like the OECD and World Bank have added SME sustainability into their recommendations (Diepolder et al., 2021). For instance, according to the OECD's SME Policy Index for emerging Europe, SMEs are "crucial drivers of sustainable economic growth, " which calls for integrating sustainability into SME development strategies end-ilibrary.org. More and more standards and reporting frameworks are being applied to smaller firms. ISO 14001 environmental management certification was previously popular among large companies (Watson et al., 2023). There is now more straightforward guidance for SMEs to apply it. In the same way, the Global Reporting Initiative (GRI) has tools associated with sustainability reporting that fit SMEs, and the B Corporation movement offers certification to companies (notably medium-sized / start-ups) that satisfy strict social/environmental performance benchmarks (Lüdeke-Freund, 2020). These frameworks help SMEs to formalize their sustainability efforts through creating awareness and incentives.

5.7.2. Evolving Regulations and Market Requirements:

Policymakers are quickly bringing rules that are indirectly or directly forcing SMEs for sustainability. For example, in the European Union, new legislation including the Corporate Sustainability Reporting Directive (CSRD) will require even listed SMEs to report on ESG (Environmental, Social, Governance) performance starting in 2026(*New CSRD Sustainability Reporting Covering More Companies and More Disclosures | S&P Global*, 2022.). Even smaller companies that are not listed will also

feel “trickle down” effect. These may also have to be shared with bigger clients. Many countries are introducing carbon pricing and green taxes that cover SMEs for example, Denmark’s recent carbon tax applies to all firms (including SMEs) at a rate of €150 per ton CO_2 (Patrick Lenain , 2022). Businesses are incentivized to lower emissions to avoid extra costs through the respective measures.

Another lever is government green procurement policies: for example, Sweden now requires sustainability criteria in public, meaning an SME must meet certain environmental or social standards to win government contracts. These policy adjustments indicate that it’s becoming a floor requirement for business in sustainability. SMEs that align early on will find it easier to transition and may gain preferential access to financing and markets(Chen et al., 2023). On the other hand, governments are making positive offers SME greening grants, tax breaks, or help with other technical assistance. Many European Union countries offer subsidy programs to small- and medium-sized enterprises (SMEs) that invest in energy efficiency or renewable energy (Chen et al., 2023; Z. Hussain et al., 2022; Melnyk et al., 2023). Governments set up incubators to promote green enterprises in the Asia region and other areas. Sometimes, they do it with the help of development agencies, or they set up challenge funds to do this.

5.7.3. Pakistan Emerging Initiatives

SMEs and entrepreneurship policy landscape in Pakistan is relatively new. It has been observed in the traditional SME polices of Pakistan (such as the SME Policy 2021 of SMEDA) that they deal on access to finance, business formalization and skill development issues but are not dealing on environmental sustainability issue(Waris et al., 2021). Nevertheless, aspects of sustainability are starting to appear in national strategies. For example, Pakistan’s obligations under the Paris Climate Agreement as well as its national climate change policy require cleaner production and renewable energy. This has implicated SMEs in textiles, agriculture, and energy among other industries. Practical support is also growing.

The State Bank of Pakistan has released Green Banking Guidelines for banks to expand green lending. Additionally, some concessional financing schemes target SMEs for renewable energy. Karandaaz, a Pakistani leading development finance institution, launched the “GreenFin” Innovation Program to provide funding for the green economy. There are significant businesspeople focused on green loans in SME

loans. This program provides blended finance (concessional loans up to PKR 50 million) and business support to SMEs making climate-friendly solutions.

According to Karandaaz, “GreenFin Innovations has been launched to bring scalable innovative solutions to counter climate change in Pakistan. "Offering concessional finance to enable businesses to play a critical role in advancing a green economy" (smefinanceforum.org). Pakistani SMEs are gaining assistance in investing in solar energy, waste management, sustainable agriculture and other sources, through such initiatives. Moreover, several donor-funded schemes, such as those from UNDP, GIZ, USAID, etc., have launched green SME challenge funds or accelerators to encourage eco-entrepreneurship. This includes grants to SMEs in clean tech or training on cleaner production for textile SMEs. Pakistan doesn’t have a green SME policy yet, but recent developments indicate that SME development is starting to align with sustainability.

5.7.4. Türkiye – Policy and Institutional Support:

Türkiye has increased supports force for businesses including SMEs towards sustainability amid its integration with Europe and the global value chains. Türkiye has unveiled its Green Deal Action Plan, which was presented in 2021 and has a goal of alignment with EU Green Deal, with the explicit mentioning of the need for the preparation of Turkish SMEs for the anticipated green transition (eg. compliance with the upcoming carbon regulations, gradual adjustment of green production etc.). One example is the Türkiye Green Industry Project, financed by World Bank, whose implementation is being carried out by the Ministry of Industry and Technology and the national SME agency (KOSGEB).

The main objective of this project is to provide an effective green transformation support for industrial enterprises in Türkiye, particularly SMEs (Bağiş et al., 2023; Tok et al., n.d.). Small and Medium Enterprises (SMEs) can boost their competitiveness and innovation through KOSGEB. It provides financial assistance and technical support to help SMEs adopt green technologies and practices for example, sub-loans or grants for installing solar panels, upgrading to energy-efficient equipment, and implementing circular economy processes. The project's goal is to reduce the environmental impact of SMEs while enhancing competitiveness in global markets through the improvement of the energy and resource efficiency and carbon footprints of SMEs. This is important since Turkish exporters, mostly SMEs that operate in a

wide variety of sectors (textiles, auto-parts, etc.), are increasingly being faced with sustainability demands by EU customers and regulations.

In fact, the government has increasingly portrayed green transformation as an essential measure to "protect and strengthen [the] country's competitiveness in exports. especially to the EU" (Bağiş et al., 2023). In addition to this project, there are also Turkish development banks and agencies (e.g. TUBITAK and KOSGEB) that have set up innovation grants for clean tech, and some bigger banks (e.g. Garanti BBVA) which have launched green financing for SMEs (e.g. lower interest loans for energy efficiency investments). The Association of Turkish Business (TÜRKONFED), among other business associations in Türkiye, is increasing awareness and developing toolkits by SMEs to enhance resource efficiency and digitalization simultaneously (the "twin transformation"). Combined with regulation alignment and direct support mechanisms, Türkiye's policy framework is overall becoming more conducive for sustainable entrepreneurship.

At both the global and regional levels, generations appear to converge to form a supportive environment for SMEs with sustainability entrepreneurship. Even though challenges still exist, for instance in developing markets many small and medium-sized firms are still finding it hard to access green finance and expertise(Tok et al., 2023.). But the trajectory remains towards progress. Governments and global organizations consider SMEs to be key allies in achieving sustainability goals and therefore, are trying to remove barriers available in the form of funding, information, incentives, etc. Having said that, there is also a caution in making sure the policies are realistic and also in the ambit of SMEs. Though many governments have sustainability frameworks "on paper", these is not always easily accessible to smaller enterprises, notes one analysis. "Whatever policy is developed for the sake of green practices… should be equally and easily accessible for all, from SMEs to corporations". In the absence of appropriate measures, larger firms will benefit while SMEs will lag because of capacity constraints. To include SMEs in training, financing and setting standards are designed to give priority to policy.

5.8. Case Studies and Examples of Sustainable SMEs

For a better understanding of sustainable entrepreneurship, we will highlight a few examples of SMEs (from different regions) that have practically incorporated sustainability into their business practices.

5.8.1. Pakistan Modulus Tech

An SME startup that is working to solve social and environmental issues through sustainable housing. ModulusTech specializes in low-cost modular housing units that are ultra energy-efficient and flat-packed for easy transport. The housing units utilize recycled materials and locally sourced resources to achieve net-zero energy. ModulusTech innovation brought it worldwide exposure – for instance, the UN Environment Program awarded it for low-cost modular flat-pack housing made from recycled materials as an ultra-energy efficient solution to Pakistan's 10 million unit housing crisis for unep.org. Mr. Phasing is a modular phasing technology enabling effective execution of projects without demand disruption. Our approach has been to standardize the accommodation by providing required quantities almost instantaneously ensuring effective scheduling. It meets SDG goals by targeting 'Sustainable Cities'.

5.8.2. Türkiye Biolive

A biotech startup from Türkiye that makes bioplastics from agricultural waste. Biolive has invented a patented method to convert discarded olive pits into a 100% bio-based and biodegradable plastic. the abundant exhaust from olive oil production in Türkiye provides the raw material. This biomass can serve as an alternative to standard plastics that we use in a variety of applications. Besides, it also makes a productive use of waste. The stuff that the company sells can also help to valorize waste. Also, they have commercial marketability in the plastics industry as its consumers and manufacturers are now looking for greener materials. The model that Biolive is following has similarities with circular economy which supports eleven out of the seventeen SDGs. The startup has signed sales contracts abroad and won an innovation awarditfood.eu. A small business like Bioéthique stands as proof that a solution to an environmental problem, namely olive waste, can serve as the basis for a green product that generates economic, social, and environmental value.

These examples show that sustainable entrepreneurship is not just a theory. Many SMEs are already implementing it in practice. There is great scope for SMEs to innovate sustainably across sectors such as construction, material sciences, fashion, energy, agriculture and more. The benefit of people-planet-profit was achieved by each social entrepreneur in their own unique way through eco-friendly social housing, greener plastic, and closing the loop of fashion waste, respectively. Businesses that

succeed in sustainability often rely on local strengths like an abundant waste resource (olive pits) or local market needs (housing). They partner with supporters (NGOs, government grants etc.) and communicate the value of their sustainable products to consumers.

Especially, these case studies also reflect regional contexts. Young entrepreneurs in Türkiye and Pakistan seem aware of globalization and sustainability trends. To resolve local issues, their startup venture often with the help of incubators or competitions that did not exist ten years ago. Their achievements can inspire all other SME owners to realize that they can innovate, differentiate and take pride in integrating sustainability into their practices, which will not only be a cost or obligation. It also emphasizes an enabling ecosystem: ModulusTech benefited from challenges and grants for low-carbon solutions; Biolive leveraged Türkiye's strong agricultural and R&D ecosystem; Phinix rode the trend of community awareness among consumers.

5.9. Summary

All things considered, sustainable entrepreneurship for SMEs is a promising and dynamic field. The theory is that organizations should implement a triple-bottom-line approach to impact. There is evidence from across the globe, including Pakistan and Türkiye, that more organizations are adapting to these approaches, but they face challenges which need to continue offering support. Once SMEs overcome those obstacles, they can benefit from competitive advantages, cost savings and contribute to global sustainability in meaningful ways. The SME sector is slowly but surely turning into a catalyst for sustainable development thanks to focused entrepreneurs, supportive policies, and rising market demand for sustainability. As research and practice progress, more SMEs will likely prioritize sustainability in their entrepreneurial endeavor for innovation that positively impacts the business and society outside it.

CHAPTER VI

SUSTAINABLE ENTREPRENEURSHIP FOR SMES: A CASE STUDY OF PAKISTAN AND TÜRKIYE

6.1. Introduction

SMEs help the economy grow, create employment opportunities, and are good at making new things. Given the current climate change scenario, resource scarcity, social inequality, and other global challenges, sustainability must be embedded in entrepreneurship. Sustainable entrepreneurship pursues economic goals in association with social and environmental objectives. It offers SMEs the chance to achieve long-term sustainability. This study examines how SMEs in Pakistan and Türkiye are taking heed to sustainable entrepreneurship and what they can learn from each other.

6.2. Conceptual Structure

Sustainable entrepreneurship is an entrepreneurial activity that simultaneously produces economic prosperity, environmental protection, and social well-being (Crecente et al., 2021; Theodoraki, Dana, & Caputo, 2022). Due to their flexibility and innovation capacity, SMEs can effectively transition toward sustainability, especially when they are offered appropriate institutions.

Key dimensions:

1. **Economic sustainability**: Profitability, scalability, and employment generation.
2. **Social sustainability**: Community development, ethical practices, inclusivity.
3. **Environmental sustainability**: Eco-friendly production, resource efficiency, carbon footprint reduction.

6.3. The SME Sector in Pakistan and Türkiye

SMEs usually refer to as small and medium enterprises. It may refer to the total annual turnover, balance sheet totals, and number of employees. According to the EC (2020), SMEs are defined as enterprises that employ fewer than 250 people. Also, they have an annual turnover not exceeding €50 million. Further, they have a balance sheet total not exceeding €43 million. KOSGEB typifies SMEs into categories: micro (1-9) small (10-49) and medium (50-249), a typological used in Türkiye as well. Pakistan's SMEDA has adopted a more generic definition. According to it, SMEDA refers to

SMEs as businesses with up to 250 employees. However. There are variations across sectors (SMEDA, 2024).

In both countries, SMEs represent a significant proportion of the economic ecosystem. Startups are important because they provide jobs and help everyone to benefit from economic growth. It also helps regions to develop and is important for sustainable innovation, as well.

6.3.1. Size and Contribution of the SME Sector

Almost 90% percent of the total enterprise in Pakistan comprises SMEs. They contribute around forty percent to the GDP, employ around seventy-eight percent of the non-agricultural labor force and account for almost twenty-five percent of total exports. (SME. N.D.) Most SME clusters are found in textiles, agribusiness, retail trade, leather goods and light manufacturing. But most operate informally/semi-formally and are domestically oriented (World Bank, 2022).

In Türkiye, 99.8% of the registered enterprises are SMEs. SMEs play an important role in terms of employment by employing about 73.8% of the labor force. In 2021, SMEs generated approximately 60% of national GDP. SMEs contributed 62.3% of total exports. (TOBB, 2024; Turkish Statistical Institute, 2023) The sector provides machinery for textiles, cars, construction, IT, logistics, etc. Moreover, many SMEs are part of the EU and global supply chains (OECD, 2022).

6.3.2. Sustainability and Institutional Support

According to Ministry of Industry and Technology (MoIT, 2023), “2023-2025 SME Strategy” gives priority to green innovation, circular economy models, and climate resilience through a combination of regulatory measures, grants, and Public, Private Partnership (PPPP). Türkiye's SMEs are now not only meeting global ESG standards but also using them to gain an edge in competition. This shift is especially beneficial to export-oriented sectors like sustainable textiles, organic food processing, and green construction.

With the adaptation of the European Green Deal and commitment to net zero emission by 2053 (UNFCCC, 2023), Türkiye has enhanced sustainability in SME development. With the support of EU funds, institutions such as KOSGEB and TÜBİTAK have developed green programs (the Green Transformation Support Program, for instance)

to ensure that small and medium-sized enterprises adopt energy efficiency technologies and implement eco-innovation and environmental management systems.

On the other hand, the SME sector of Pakistan is at a much earlier stage of its sustainability transition. According to a report published by the Government of Pakistan in 2021, policy for 2021-2025 on SME recognizes the key requirement of green innovation. However, the implementation of sustainability framework is weak and sporadic. Structural challenges.

Hurdles which hinder the sector evolution towards eco-sensitive business models like restrict access to green finance, low environmental awareness, and weak regulatory enforcement (State Bank of Pakistan 2021).

But you can see some progress. For example, the Punjab Green Development Program is supported by the World Bank which helps SMEs better comply with environmental regulations. Furthermore, it encourages more cleaner production techniques (World Bank, 2022). Institutions like SMEDA, Karandaaz and HEC incubation centres are also taking steps to promote sustainable practices in organic farming, recycled textiles, renewable energy startups, etc.

6.3.3. Comparative Perspective and Outlook

When it comes to structure, Pakistan's SMEs face more systemic constraints. However, these same SMEs also represent an untapped reservoir for sustainable development, particularly given the large youth population, natural resource base and growing demand for green jobs. With the right ecosystem support, Pakistan's SME sector can promote climate smart, inclusive, and ethical entrepreneurship directly assisting the government's SDG approach.

Institutional capacity and policy alignment, Türkiye's SME sector is much more aligned with global sustainability standards than Pakistan's. By aligning closely with the EU Green Deal, ensuring access to EU markets, and strengthening their innovation infrastructure, the legislative framework provides SMEs with both the regulatory push and economic pull to invest in green transformation.

6.4. Sustainable Entrepreneurship in Pakistan

SME's contribution to GDP, exports and employment of a country is a good measure to check the relevance of SME's policies and development. In Pakistan, Small and

Medium Enterprises (SMEs) contribute around 40 percent to GDP, 25 percent in exports and they account 78 percent in employment (SMEDA, 2024). Even though entrepreneurs play a major part in the economy, they do not believe in sustainable practice. According to Khan (2020), the sectors where SMEs operate are mainly informal or semi-formal. The short-term focus of many companies. Because of this, it means managing cash, dealing with bureaucratic red tape, and getting access to necessities rather than implementing long-term sustainability practices like environmental sustainability, ethical governance, and social innovation.

A challenge for sustainable entrepreneurship in Pakistan is limited access to green finance. Even as national-level lenders and microfinance institutions widen credit access for SMEs, dedicated financing instruments for eco-friendly ventures are still absent. As per the green banking guidelines provided by the State Bank of Pakistan in 2021, there is a marginalization of finance in SME portfolios due to risk averse lending policy and low level of financial literacy amongst entrepreneurs.

People in rural and semi-urban areas don't know much about sustainable business models. That is another big challenge. A lot of small and medium-sized enterprises often have no knowledge of the circular economy, energy efficiency and climate-resilient business practices. Most schools and vocational training do not have lessons on sustainable entrepreneurial issues (Siddiqui and Jalil, 2021).

On the policy side, schemes such as the SME Policy 2021, developed by the Government of Pakistan, is a first step towards cultivating inclusive and sustainable entrepreneurship. The policy aims to improve access to finance, digitalisation, and capacity building. But critics argue that the policy doesn't have any enforceable mechanisms and sectors-specific strategies for green entrepreneurship. In a similar vein, Punjab Green Development Program (PGDP) – another World Bank project – aims at influencing environmentally sustainable practices in SMEs through infrastructure development, regulatory support and conducting environmental assessments. Even so, there still is quite a lot of fragmentation and unevenness in implementation across different regions. For example, urban clusters get more attention from institutions compared to peri-urban or rural spaces.

Additionally, the rules in Pakistan are not allowing SMEs to incorporate sustainability into their businesses. Green tax breaks, sustainable product stamps or offers to buy will not be further refined as well as inaccessibly small business. Due to no

institutional mechanisms that reward sustainable behavior, SMEs often see it as costly or bureaucratic.

Social enterprises and other mission-driven start-ups are increasingly coming up in sectors such as renewable energy, organic agriculture, ethical fashion, and waste management despite the challenges faced. Karandaaz, Invest2Innovate, and Pakistan Innovation Foundation and similar players are working towards building a more supportive ecosystem for sustainable entrepreneurs via capacity building, mentorship and funding.

the SME sector in Pakistan has an enormous potential for sustainable development but lies on the brink of change at present. The only real way to achieve significant progress is with a multi-stakeholder approach that aligns regulatory frameworks, financial instruments, educational reforms and market incentives to embed sustainability as an essential principle of entrepreneurial success.

6.5. Current Landscape of Sustainable Entrepreneurship in Pakistan

In Pakistan, Small and Medium Enterprises (SMEs) are an important component of the national economy. They contribute 40% to the GDP as well as 80% to employment (SMEDA, 2024). Looking into the importance of this, the SME Policy 2021 and other national framework acknowledges the importance of encouraging green innovation and sustainability for SMEs. The policy objectives are not being put into practice meaningfully in regions. Most entrepreneurs are driven by necessity. These business owners focus on survival and not opportunity or environmentally sustainable business models. The sustainability of SMEs is beset by limitations and restrictions, mostly structural such as access to finance, lack of awareness, weak institutional support. Some areas will be more successful than others. The agribusiness, textiles and information technology sector will have new opportunities for incorporating sustainability because they are resource-intensive, export-oriented and technology-driven.

6.6. Entrepreneurial Education and University Ecosystems in Türkiye and Pakistan

Higher education institutions play a major role in shaping a sustainable and innovative mindset among future entrepreneurs and businesspersons. Both Türkiye and Pakistan,

universities are becoming a key player of the entrepreneurial ecosystem. Nevertheless, how they vary in promoting sustainable entrepreneurship and institutional capacities.

6.6.1. In Context of Pakistan

Higher education commission (HEC) is in concrete scheme in Pakistan for entrepreneurship. HEC has established more than 40 business incubation centers (BICs) at public and private universities across the country (HEC, 2023). The aim of these centers is to encourage students to think of innovations or start-ups through co-working spaces, etc.

Still, not many universities offer sustainability-focused modules in their programs. Research indicates that most entrepreneurship programs focus on fundamental skills for business startup and economic viability and not on frameworks for socio-environmental impact or content on green innovation (Siddiqui and Jalil, 2021). Some progressive institutions like LUMS, NUST, and IBA Karachi are offering electives in sustainability, environmental economics, or climate entrepreneurship. However, these are not yet systemically offered through national educational policy and across the university network at large.

Furthermore, there are hardly any incubator programs offered by universities in Pakistan for SDGs or green startups. Most students' ventures remain necessity-driven which basically target traditional sectors like retail, digital marketing and food delivery, etc rather climate-resilience, resource efficiency or ethic innovation (GEM Pakistan, 2021).

6.6.2. In Context of Türkiye

The higher education ecosystem of Türkiye has increasingly become organized and innovative. Over the last ten years, the government has made investments in university-based techno parks, R&D centres, and startup incubators to nurture entrepreneurs and assist in commercialization of research (Ministry of Industry and Technology, 2023). Türkiye is home to 80 techno parks and more than 1200 R&D centres with a university affiliation according to the Council of Higher Education (YÖK). At least half of these R&D centres are focused on green innovation, cleantech and sustainable production (YÖK, 2023).

Also, Türkiye has been aligning its curriculum with EU-funded programs such as Horizon Europe and Erasmus+, and currently, the Instrument for Pre-Accession

Assistance (IPA) includes the modification of curricula to include sustainability modules, design thinking and green entrepreneurship training in the business, engineering and environmental studies. Programs like TÜBİTAK's BIGG (Entrepreneurship Support Program) are increasingly collaborating with universities to coach early-stage entrepreneurs, with growing attention to climate and SDG-focused initiatives (TÜBİTAK, 2023).

The institutional structure works to not only build technical capacities but also encourages interdisciplinary problem-solving that building a resilience, sustainable business model. As a result, Türkiye is seeing an emergence of student-created startups with innovative ideas in a variety of fields like green software, organic agriculture, renewable energy, and sustainable textiles especially at its major universities like Istanbul, Ankara and Izmir.

Both Türkiye and South Africa agree that higher education contributes to entrepreneurial development; Türkiye is the more mature sustainability-driven model. The backing of funds supported by the European Union, techno-parks, and a national emphasis on the green transition have enabled the Turkish universities to align their entrepreneurial support structures with climate goals and circular economy principles. Even being a youth powerhouse, Pakistan today lacks curriculum intervention through policy, sustainability-focused startup programs, and faculty training for green entrepreneurship. To close this gap, it will require the national strategy to embed SDG-aligned entrepreneurship education. It should boost university-industry linkages and incentivize student ventures dealing with environmental and social challenges.

6.7. Challenges and Opportunities for Sustainable Entrepreneurship in Pakistan

6.7.1. Challenges

Sustainable entrepreneurship has become a global discussion topic, yet Pakistan's SME sector is facing serious structural and institutional challenges to the implementation of sustainable entrepreneurship.

6.7.1.1. Lack of Awareness and Education

Most SME owners are not aware of the principles of Sustainability which includes the Circular economy, green innovation, sustainable entrepreneurship etc. The absence of formal training, limited inclusion of sustainability in business curricula, and weak industry-academic linkages largely account for this (Siddiqui & Jalil, 2021).

Consequently, sustainability is frequently seen as a cost and not as a key to long-term competitiveness.

6.7.1.2. Limited Access to Green Finance

A major constraint is the inaccessibility of finance/credit with a sustainability focus. There isn't much choice of green financial products, like eco-loans or climate funds, or rather their scale and reach is limited. Often Micro and informal SMEs do not have any collateral, formal registration or financial literacy to access bank financing (SBP, 2021) There are limited facilities in the country. Most of these operate on a pilot basis and serve urban or semi-urban clusters.

6.7.1.3. Weak Policy Implementation

Policies like the SME Policy 2021 and other provincial programs such as the Punjab Green Development Program incorporate green objectives. However, the implementation mechanisms are weak, given limited monitoring, enforcement and decentralization (World Bank, 2022). A gap exists between national sustainability objectives and the realities on the ground, especially in rural and peri-urban areas

6.7.1.4. High Informality and Low Institutional Trust

A huge number of small and medium enterprises (SMEs) in Pakistan operate without registering themselves. It becomes tough to integrate them into formal sustainability programs or provide them structures support. Due to low trust, complex government processing procedures discourage compliance with environmental or labor standards (Khan, 2020).

6.7.1.5. Technological Constraints

Most small and medium enterprises cannot adopt sustainable practices because of limited technology. Energy-efficient machines, waste recycling systems or green production methods are unavailable or too expensive for small businesses.

6.7.2. Opportunities

Despite challenges, sustainable entrepreneurship in Pakistan has opportunities. These can be utilized if Pakistan's policy and ecosystem support these opportunities.

6.7.2.1. Demographic Dividend and Youth Entrepreneurship

With more than 60% of Pakistanis under the age of 30, there exists a considerable potential for university graduates and youth innovators to promote green & social entrepreneurship in the country. Tech-enabled and sustainability-oriented startups are on the rise, as demonstrated by platforms like Invest2Innovate, National Incubation Center (NIC) and Startup Pakistan.

6.7.2.2. Digital Transformation

As e-commerce, fintech, and digital payment systems have grown, new business models that are inclusive and environmentally friendly have emerged. SMEs that use digital platforms can lessen carbon footprints, improve transparency, and market more responsibly.

6.7.2.3. Global and Regional Trade Pressures

Small and medium-sized enterprises (SMEs) in textiles, agriculture, and manufacturing that are focused on export are increasingly being asked by international buyers (for example, the EU, North America) to conform to Environmental, Social, and Governance (ESG). This kind of pressure can work as a market force incentive for Pakistani SMEs to adopt sustainable practices and acquire certifications like ISO 14001, Organic or Fair Trade.

6.7.2.4. Rise of Islamic Finance and Impact Investing

Pakistan offers a strong ecosystem of Islamic finance that offers routes for introducing Shariah-compliant sustainability integrating financing model including green sukuk qard al-hasan and mudarabah-based impact funds. They are in accordance with the Islamic values of maslahah (social welfare), amana (environment), and adl (justice).

6.7.2.5. Government and Donor Support

International aid agencies, like the World Bank, the UNDP, and ADB, are financing green SME projects and capacity-building programs in Pakistan. Pakistan's Climate-Smart Agriculture Program and National Electric Vehicle Policy (2020) are other examples of how policies have shifted toward sustainability which could encourage new areas for advancement and scaling for the SMEs.

Pakistan's sustainable entrepreneurship is not without its hurdles. From financing and technology to regulatory problems, they're just some of the most pressing systemic

challenges. However, there are just as many opportunities. Pakistan can use its youth potential, expand green finance access and align with global ESG trends to re-position its SME sector as a force for inclusive, ethical, and environmentally sustainable growth. The secret is in creating enabling ecosystems through integrating policy and finance, education and technology towards a common vision.

6.8. Sustainable Entrepreneurship in Türkiye

Sustainable entrepreneurship in Türkiye is far-reaching and systematic, especially the SME sector, which accounts for a major portion of the economy. Businesses regarded as SMEs in Türkiye represent more than 99% of all registered businesses in Türkiye, represent approximately 73% of total employment and generate approximately 60% of all value-added production (TOBB, 2024). The numbers show how important SMEs are for the social and economic life in Türkiye, and how they can help Türkiye's transition to sustainability.

One of the main forces shaping sustainable entrepreneurship in Türkiye is its compliance with the European Union's (EU) ecologic requirements including the EU Green Deal imposing heavy carbon-reduction commitments, ESG compliance and eco-innovation on all supply chains. Türkiye has committed to net-zero emissions by 2053 (UNFCCC, 2023) through the update of its nationally determined contributions (NDCs). This update creates regulatory and market incentives for SMEs to become sustainable. EU buyers and international markets' ESG requirements has prompted action among export-oriented SMEs.

The KOSGEB Green Transformation Support Program, initiated by the government, has been effective in speeding up the process. KOSGEB (Small and Medium Enterprises Development Organization of Türkiye) provides support for SMEs that want to use resource-efficient technology, cut their emissions, or create environmentally friendly products at reduced costs (KOSGEB, 2023). European Union (EU) funded technology hubs, incubators in universities, and innovation parks have also upgraded this program, which gives birth to sustainable innovation ideas and business incubation.

Türkiye's industrial policies promote clean production, circular economy, and digital transformation so that sustainable entrepreneurship is conducted not only for compliance but also as a driver of innovation and competitive advantage. For example,

in 2023 Industry and Technology Strategy green transformation is in focus and investments on renewable energy, green infrastructure and sustainable manufacturing processes are being made (Ministry of Industry and Technology, 2023).

Sustainability is not always easy for Türkiye, as we will see. In recent years, the financial robustness of SMEs has been affected by economic volatility, rising inflation and fluctuating energy prices. As a result, many SMEs are adopting austerity measures and cutting down costs rather than investing in sustainability (OECD, 2022).

If the G20 launched a global social contract to address global problems, it would achieve greater credibility. Nevertheless, a mindset shift is gradually emerging. Sustainability is not a mere "regulation compliance" issue, especially for younger generation Turkish entrepreneurs, but rather an opportunity for market differentiation, reputation and long-term profitability. Look at case studies ranging from sustainable textiles to eco-tourism and you will find a growing wave of ethically driven businesses creating environmental and social value through their business operations.

In short, Türkiye is in a strong position in creating sustainable entrepreneurship in SMEs thanks to its relatively mature policy environment, proximity to the EU market, and institutional support mechanisms. Although there are still problems like economic stability and regulations, Türkiye really does try to make entrepreneurship more sustainable to global standards. Therefore, financing and creating policies really helps Turkish SMEs to make them more resilient and competitive globally.

6.8.1. Current Landscape of Sustainable Entrepreneurship in Türkiye

Small and Medium Enterprises (SMEs) in Türkiye comprise of more than 99,8% of active enterprises, 73,8% of total employment and nearly 62,3% of total exports in 2023. (TOBB, 2024; Turkish Statistical Institute, 2023) Because they contribute significantly to production and employment, as a result, SMEs have assumed a critical role in reaching national sustainability objectives. This is especially so at net-zero by 2053 (COP26, Glasgow) as committed by Türkiye. The capabilities are aligned with the Green Deal of the European Union and with the greater EU-Türkiye Customs Union which helps in the environmental sense of various sectors.

In response to the global and regional momentum, Türkiye has implemented a series of policy measures and support programs to SMEs. The current KOSGEB Green Transformation Support Program supports SMEs to adopt low carbon technologies,

energy efficiency and waste reducing measures. This initiative grants funds and offers low-interest loans for small and medium-sized enterprises investing in greening machinery, pollution control and circular economy solution (KOSGEB, 2023). Moreover, the Ministry of Industry and Technology's 2023–2025 SME Strategy and Action Plan highlights the green transformation under its main purpose and focuses on climate-oriented production, digitalization and environmental innovation (MoIT, 2023).

There has been a significant rise in eco-innovation centers, sustainability accelerators, techno-parks in Türkiye, particularly in the biggest cities like Istanbul, Ankara, and Izmar. The hubs financed with EU IPA (Instrument for Pre-Accession Assistance) aid generate technical training, seed money, and access to a green infrastructure for starting stage start-ups and SMEs in sustainable agriculture, clean energy, water conservation, and green manufacturing sectors (European Commission, 2022).

Türkiye has a higher rate of sustainable startups and environmental innovation than other developing economies like Pakistan. This is due to changes in the policies at home and market pressure abroad. Adoption by SMEs

For example, export-oriented SMEs in the textile, auto, and food processing sectors have started adopting ISO 14001, Eco-Label, and REACH standards to remain competitive in EU markets (OECD, 2022). Sustainability is seen as a competitive advantage that can help SMEs enter overseas markets, attract investors concerned about ESG, and remove business risk; it is not just changing rules, but business economics.

However, not all category of SMEs practices diffusion is homogeneous. Bigger companies that export are likelier to engage with sustainability, micro and rural companies have financial and technical constraints, and they don't have awareness of regulatory changes, and low access to capital and environmental literacy (EIB, 2022). To narrow the divide, Türkiye has kickstarted regional capacity-building programs and green training modules through public-private partnerships to decentralize sustainability knowledge and promote inclusivity in the green transition.

To sum it all up, the SME landscape of Türkiye is going through a structural shift towards sustainable entrepreneurship, supported by the blend of policy reforms, institutional capacity and market incentives coherent with the EU. Although there are

still gaps between big and small firms, the overall trend shows a rising national movement towards embedding sustainability into entrepreneurship and SME competitiveness.

6.9. Challenges and Opportunities for Sustainable Entrepreneurship in Türkiye

6.9.1. Challenges

Even though Türkiye made it easier to become part of the EU market through policy improvements, the country still struggles to achieve sustainable entrepreneurship due to its structural and operational issues especially for small and micro-enterprises.

6.9.1.1. Financial and Resource Constraints

Even though Türkiye has been introducing green finance mechanisms, it remains largely out of reach for many small and medium-sized enterprises (SMEs). Micro and informal enterprises are especially disadvantaged due to stringent collateral requirements, complicated application processes and low financial literacy levels. As stated by EIB (2022), Climate-aligned finance are accessible only to a small number of SMEs in Türkiye. Mainstream SMEs either lack knowledge on eligibility or cannot meet ESG reporting requirements.

6.9.1.2. Regional and Sectoral Disparities

Adoption of sustainability measures is more concentrated in urban and export-oriented sectors like textiles, auto, food processing. According to the 2022 OECD report – SMEs based in rural and eastern regions suffer from limited institutional support systems, and there is a low level of awareness and weak linkages with green innovation networks. This kind of uneven development will not help the larger issue of sustainability transition.

6.9.1.3. Regulatory Complexity and Implementation Gaps

Türkiye's progressive policies such as the Zero Waste Regulation (2019) and its Climate Law Draft (2022) are great, but SMEs are unable to benefit from them due to overlapping regulations, inconsistency in implementation and costly administrative burdens. According to OECD SME Policy Review of 2022, smaller firms lack the technical capacity to adapt to evolving compliance frameworks. This happens particularly in sectors with EU products and environmental standards.

6.9.1.4. Limited Integration of Sustainability in SME Strategy

Small and Medium Enterprises (SMEs) still see sustainability as a cost center instead of a value driver. So, their engagement with green practices is often either tokenistic or reactive. According to EBRD (2021), most of the SMEs in Türkiye do not have sustainability as part of their fundamental business model. Instead, under the effect of inflation and soaring input costs, the SMEs focus on short-term profitability.

6.9.1.5. Skill Gaps and Low Environmental Literacy

Due to a lack of knowledge and skilled labor, SMEs are unhappy and unwilling to opt for sustainable technologies and processes. As noted in the report of the Ministry of Industry and Technology (2023), only 30 per cent of SMEs are involved in formal training or upskilling related activities. An even lower share of access courses linked to climate-smart production and digital sustainability.

6.9.2. Opportunities

Regardless, Türkiye is in a strong position to grow and institutionalize sustainable entrepreneurship within the ecosystem of SMEs because of its geopolitical, economic and demographic advantages.

6.9.2.1. Strategic Alignment with the EU Green Deal

Türkiye has a Customs Union with the EU and is aligning with the EU Green Deal. Due to March 1, 2024, scope 3 export regulation on carbon footprints could potentially block your export. If you are an SME, greening your operations offers a major opportunity to keep and grow access to European markets. As the Carbon Border Adjustment Mechanism (CBAM) comes into effect, this is an urgent priority for energy- and emission-intensive sectors like steel, cement, and textiles (European Commission, 2023).

6.9.2.2. Government Support through Green Incentives

TÜBİTAK Green Innovation Funds and KOSGEB Green Transformation Support Program are the ideal financial and technical supports for Green Innovation SMEs. Grants are given against machinery to provide energy efficiency, waste decreasing system, and sustainable packaging. The 2023-2025 SME Strategy of Türkiye also contains sustainability at its heart, cross sectoral support for low carbon transition.

6.9.2.3. Expanding Innovation Infrastructure

Türkiye has made great investments on launching innovation ecosystem. There are more than 80 techno-parks. 1200 R&D centers have also been developed in Türkiye. There are green incubators which get EU support who support cleantech and climate startups (Ministry of Industry and Technology 2023). These platforms help SMEs scale sustainable solutions through partnership formation with academia and investors

6.9.2.4. Youth-Led Social and Green Entrepreneurship

Türkiye boasts a youthful population, with over 15 million being aged 24 or younger, who are well-educated and increasingly involved in social and green innovation. Türkiye Youth Climate Initiative, UNDP Türkiye's Climate Entrepreneurship Accelerator and EU–Türkiye Town Twinning Green Startups Program have initiated new enterprises in waste management, ethical fashion and agri-tech (UNDP Türkiye, 2023).

6.9.2.5. Islamic Finance and ESG Integration

Türkiye's expanding market of interest-free banking (islamic finance) investing frameworks take into consideration the ESG norms, thus providing alternative channels for financing SMEs sustainably. Models like mudarabah, ijarah and green sukuk are consistent with ethical finance, resource stewardship and shared prosperity (IICPSD, 2022).

Türkiye has an active but complicated environment for sustainable entrepreneurship. Despite resistance from existing policy and market structures in finance, regulation and skills, which slow up-take in sustainability-oriented SMEs, EU alignment, innovation infrastructure and youth offer fertile ground for scaling. Türkiye needs to come up with measures to open access to sustainability to all; provide decentralized support to rural areas; and strengthen SMEs' capacity to turn compliance pressure into competitive advantage.

CHAPTER VII

DATA ANALYSIS AND DISCUSSION

7.1. Introduction

This chapter presents the analysis and results based on the data results from PLS-SEM. This research's hypotheses were tested using PLS-SEM, which is a second-generation multivariate analysis technique. This approach can assess both measurement and structural parts at the same time and thus could accommodate complex models with mediating and moderating relationships (Hair et al., 2011; Wani & Ganaie, 2024).

According to the study, the PLS-SEM was selected for several reasons. To begin with, it is especially beneficial regarding theory development and predictive modelling (Edeh et al., 2023; Sarstedt et al., 2014). Ease of Application of PLS-SEM (Hair et al., 2019) explain that unlike covariance-based structural equation modelling (CB-SEM), PLS-SEM does not have strict assumptions about the distribution of the data and the sample size or the joint distribution of indicators. This flexibility is particularly important for studies examining complex cause-effect relationships as in the present example.

The main aim of this study is to determine the relationship between the independent variables, Entrepreneurial Attitude, Self-Efficacy, Entrepreneurial Subjective Norms, and Perceived Barriers—on Sustainable Entrepreneurial Behavior, with the mediation of Sustainable Entrepreneurial Intention and moderation of Situational Factors and Entrepreneurial Education. This analysis gives insight into why entrepreneurs act sustainably and contributes both theory and practice to entrepreneurship.

In the following sections we assess measurement model for reliability and validity of a construct. Next, we will focus on the structural model, where we will test the relationships that we hypothesized were true. This includes moderation and mediation effects.

7.2. Data Preparation and Screening

Before doing SEM data preparation is necessary. Data preparation basically involved several important processes. These processes include data cleaning, outlier detection as well as the assessment of normality, multicollinearity and homoscedasticity. To uphold the quality and integrity of the dataset, the processes will have a significant

impact on the reliability and validity of results obtained from PLS-SEM (Partial Least Squares Structural Equation Modelling). (Hair et al., 2013).

7.2.1. Data Cleaning and Handling Missing Data

Making sure the information is accurate is known as data cleaning. If missing data isn't tackled correctly, it can greatly hinder the results of the study (Sarstedt et al., 2021). In this study, we used the mean substitution method to substitute the missing responses with the mean of that particular variable. The reason behind this choice is that the meaning of substitution preserves the sample size from the original data. Moreover, doing so helps to maintain the statistical power in the PLS-SEM. When we have little, or no, missing values on the dataset, it ensures a robust response. (Sarstedt et al., 2021) Records with more than 20% questions left unanswered or vital demographic information missing were discarded from the study to reduce bias and improve reliability (Afkanpour et al., 2024; Usakli & Rasoolimanesh, 2023). The data was protected and made sure that the results were valid.

7.2.2. Outlier Detection and Treatment

Uncontrolled outliers can affect assessments by distorting important statistical measures in many fields. This study used a two-pronged approach to examine outliers: Univariate Outliers were assessed through a z-score assessment, where values above ±3 were flagged as outliers (Mardia et al., 2024; Zhang et al., 2023) and Multivariate Outliers: Identified via Mahalanobis distance. If Deletion Observations that demonstrate a distance greater than chi-square critical at $p < 0.001$ were considered (Hair et al., 2013; Ratten, 2023).

Once identified, outliers were carefully examined. Problems were corrected for data input-take errors case. On the other hand, the authentic extreme values were either kept due to their analytical quality or removed if they caused too much distortion. Adopting this strategy allowed for the preservation of valuable knowledge from unique instances without losing the dataset's reliability.

7.2.3. Normality, Multicollinearity, and Homoscedasticity Checks

While PLS-SEM does not require normality in the data, normality assessment provides useful knowledge of the data (Hair et al., 2019; Olsen & Kenny, 2006). The Shapiro-Wilk test was used to check for normality in this study, which was found to be not normal. Also, the skewness and kurtosis values of all variables were assessed. With

values going beyond acceptable limits of -1 to +1 (Olsen & Kenny, 2006), further signifying non-normality. Even so, there were no multicollinearity problems. Indeed, all Variance Inflation Factor (VIF) figures were less than 3. Moreover, the results are within acceptable limits(Hair et al., 2013; Hancock & Mueller, 2013). The visual inspection of residual plots shows no deviations of concern. Therefore, homoscedasticity is met (Ratten, 2023; Zou & Xu, 2023).

7.3. Descriptive Statistics

These are the descriptive statistics of the sample used in this study. It contains the demographic profile of respondents and then will give an overview of the statistics of Marketing ethos. The data collected shows the makeup of the participants, which is the basis for the PLS-SEM analysis.

7.3.1. Respondent Demographics

The 389 people who took part in the study included Pakistanis and a Turkish citizen who were either university undergraduates or postgraduates enrolled in either public or private universities. The differences between the respondents from Pakistan and Türkiye profile tell a lot about the individual entrepreneur practices and the socio-economic background.

7.3.1.1. Gender Distribution

In gender-wise distribution, the percentage of male respondents is greater in the two countries as 61.9 in Pakistan and 66.9 in Türkiye. Women's participation in Türkiye (33.1%) is slightly lower than in Pakistan (38.1%). This shows the present gender gap in terms of Education and entrepreneurship, same is in Türkiye. Although both countries appear to be male dominated in participation, Pakistan's higher female representation may be indicative of a gradual trend towards gender inclusion, thanks to policies that encourage female education and participation in higher Education.

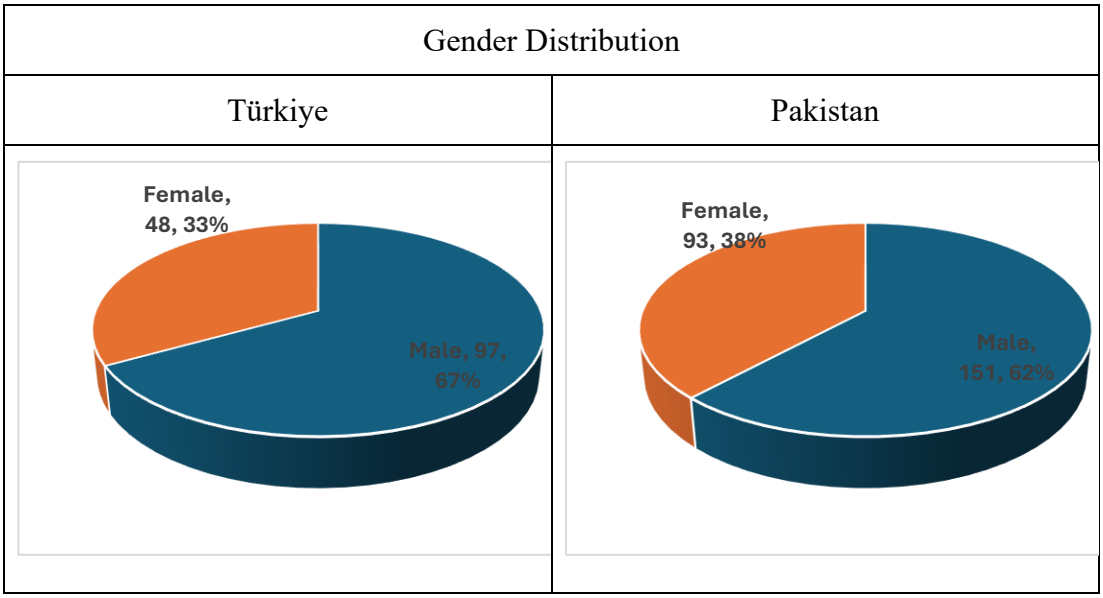


Figure 7.1: Gender Distribution in Türkiye and Pakistan

Source: Author

7.3.1.2. Age Distribution

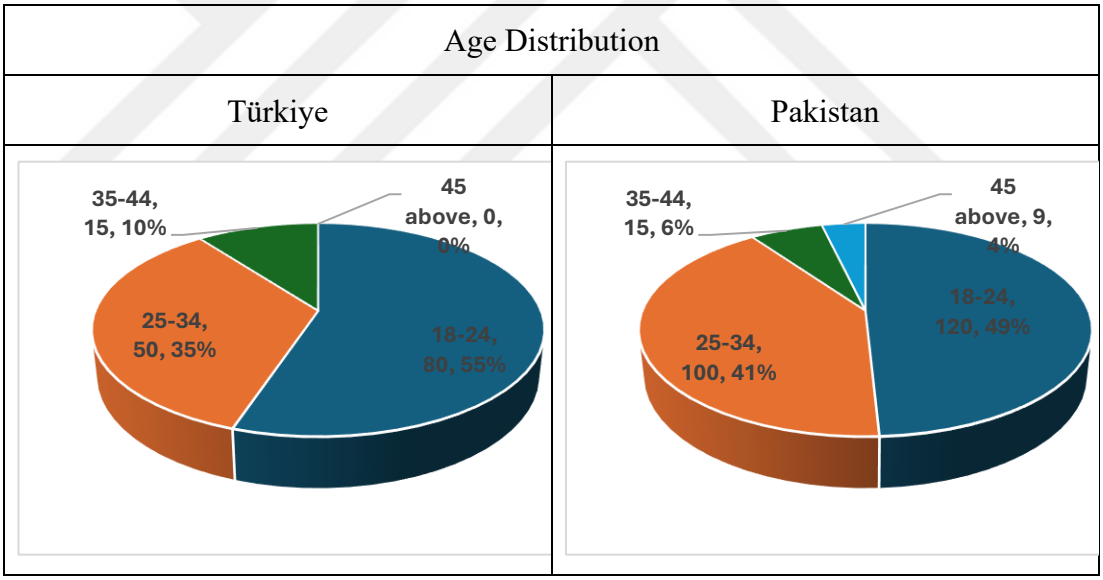


Figure 7.2: Age Distribution in Türkiye and Pakistan

Source: Author

Most of the respondents from both countries fall within the age group of 18 – 24, with Pakistan 49.2% and Türkiye 55.2%. The second largest segment belongs to the 25–34 age group with 41.0% in Pakistan and 34.5% in Türkiye. The education and activities focused on entrepreneurship mainly target youngsters. But since the proportion of Turks aged 35–44 years (10.3%) is larger than that of Pakistanis in the same age group

(6.1%), then mature persons have more opportunities or are more encouraged to take part in entrepreneurial Education for their better entrepreneurship.

7.3.1.3.Marital Status

In both countries, the proportion of single respondents is much higher. In Pakistan, it stands at 57.4%. In Türkiye, it is at 82.8%. Pakistan has a higher incidence of married respondents (42.6%) than Türkiye (17.2%). It shows cultural norms that people in Pakistan may still pursue higher Education or start their own business despite getting married. Unlike Türkiye, where entrepreneurs mostly remain single, in the west they marry, as it is believed to bring luck to the business. See figure 3

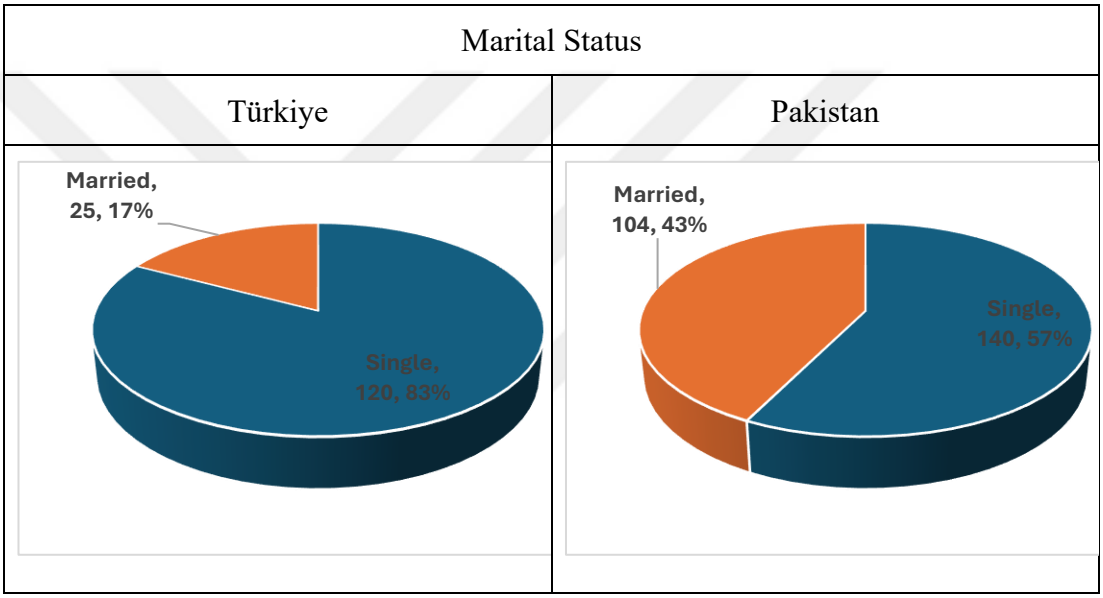


Figure 7.3: Marital Status Distribution in Türkiye and Pakistan

Source: Author

7.3.1.4. Education Level

Pakistan has 63.5% undergraduates in the respondent category and Türkiye has 62.1%. Similarly, both countries have most undergraduate respondents. Pakistan's master's students constitute 30.7 per cent while Turkish 27.6%. Türkiye has a significantly higher percentage of PhD representation at 10.3% compared to Pakistan's 3.7%. Türkiye appears to value higher education quite a lot, likely because it offers promising opportunities and strong support for research programs. Pakistan has a low percentage of candidates with PhDs. Therefore, investing in higher education and research infrastructure will increase innovation and entrepreneurship in the nation.

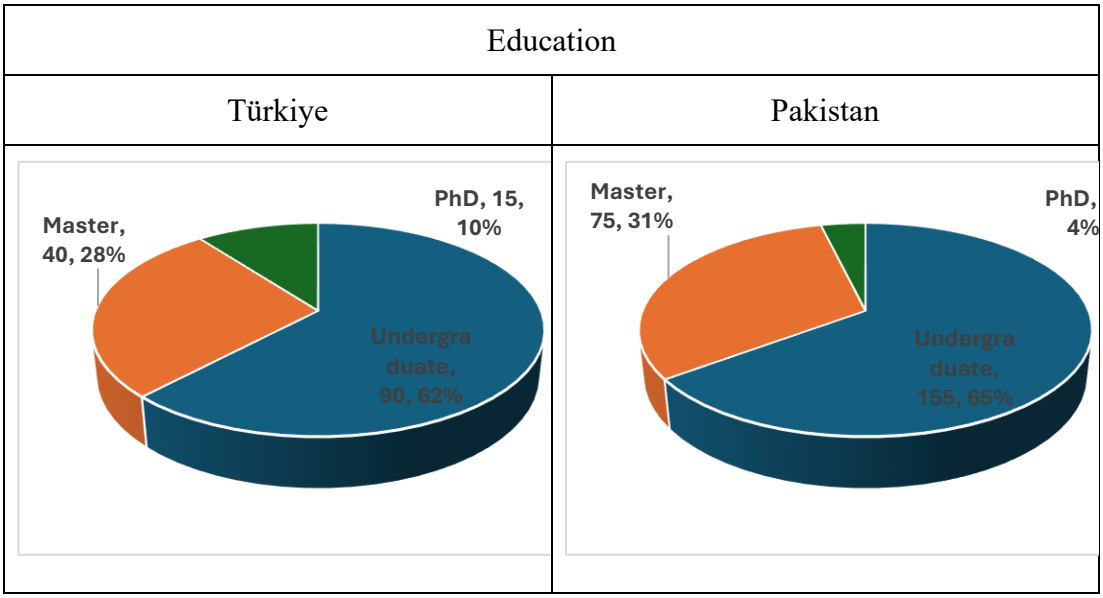


Figure 7.4: Level of Education Distribution in Türkiye and Pakistan

Source: Author

7.3.1.5. University Status

In Pakistan, 54.9% of the respondents are from public universities, whereas in Türkiye, the percentage is 37.9%. Private university respondents, on the other hand, are running high in Türkiye, which has 62.1% of total respondents from there. On the contrary, Pakistan only has 45.1% of respondents from private universities. The public universities in Pakistan seem to be catering to more students as compared to that of the UK. The reasons may relate to affordability and access. Entrepreneurial skill and venture successfulness are possibly more enhanced in Türkiye where the private university influence is high and can easily access resources and networks.

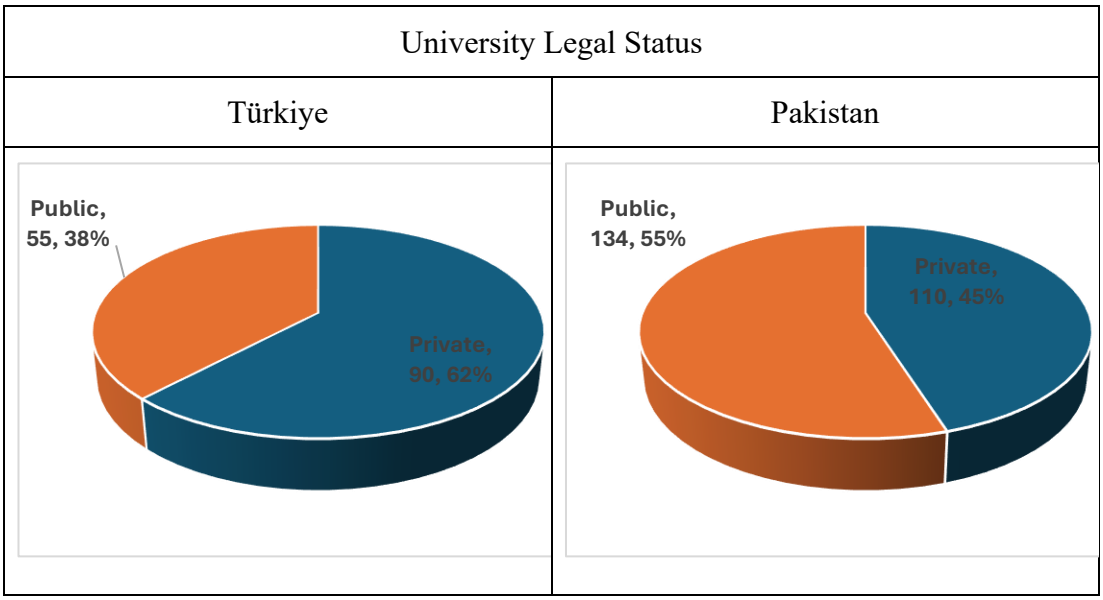


Figure 7.5: Legal Status Public/ Private in Türkiye and Pakistan

Source: Author

7.3.1.6. Entrepreneurial Engagement

Only 13.0% of respondents from Pakistan are currently working as entrepreneurs. This is considerably low compared with Türkiye, which is 38.0% The major difference could show Türkiye's entrepreneurial ecosystem is more friendly and offers better opportunities and resources to start your job. In contrast, 87.0% of Pakistani respondents are not engaged in entrepreneurship as compared to 62.0% in Türkiye. The findings show that there are considerable barriers being faced in Pakistan. These barriers relate to the lack of resources, risk aversion to cultural factors, and inadequate institutional support.

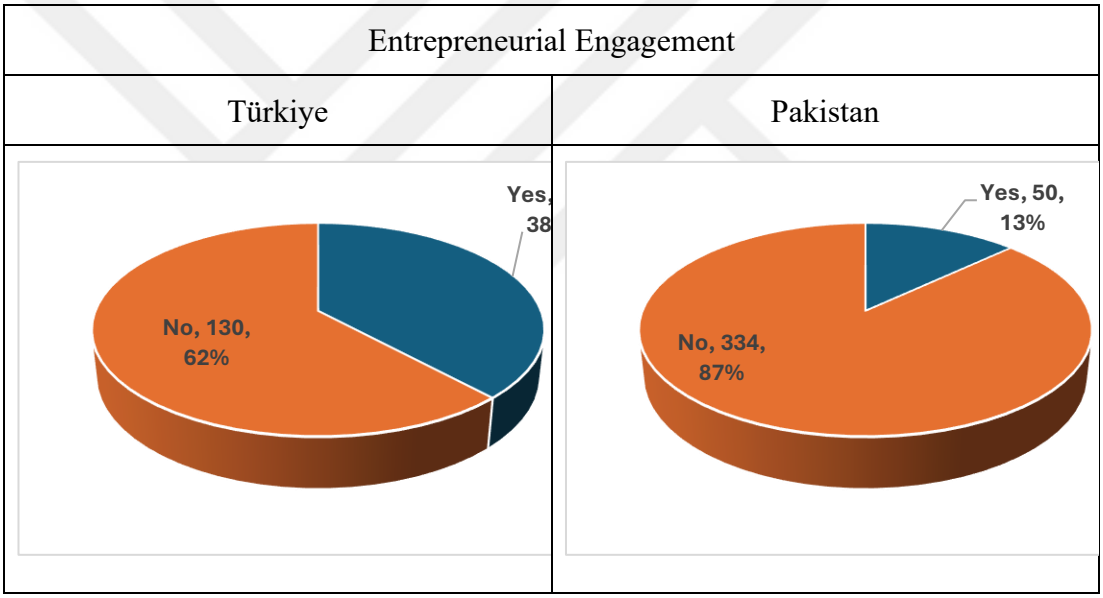


Figure 7.6: Entrepreneurial Engagement in Türkiye and Pakistan

Source: Author

7.3.1.7. Collaborative Ventures

Collaborative ventures are more popular in Pakistan (22.5%) compared to Türkiye (20.7%), highlighting cultural orientations towards collaboration for entrepreneurship in Pakistan. The reason why people in Pakistan like to partner with others could be due to their culture. They have an inbuilt concept of partnership since they are used to it from childhood. According to the study: "Given the limited access like financing and business infrastructure faced by the entrepreneurs in Pakistan, the collaborative approach may possibly be a practical response to the issue. Thus, partnerships in a way

to pool resources/mitigate risks." Türkiye's low collaborative rate paints a different picture. It suggests emphasis on entrepreneurial self-starting action, showing subjective independence as the norm. Türkiye a mature and supportive environment around entrepreneurship – which means more access to mentorship, resources, government support, etc. So, here people can go out and become entrepreneurial on their own. Türkiye's educational and socio-economic policies may also contribute more self-reliance in entrepreneurship. The key differences in approach of entrepreneurs in either country specify that individual preferences may vary due to cultural and contextual differences as well as the overall Dynamics.

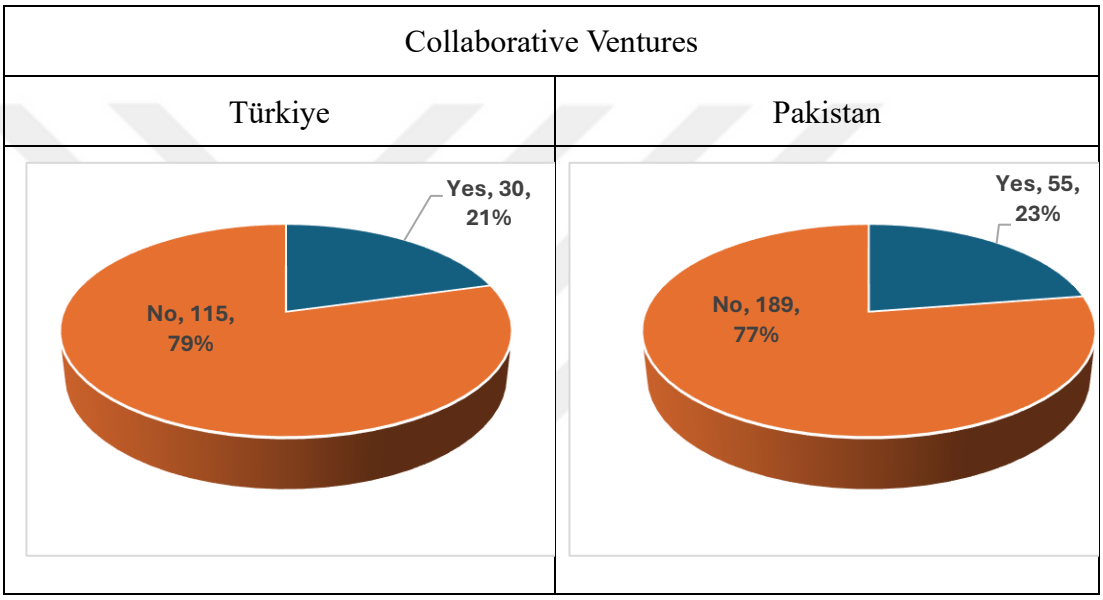


Figure 7.7: Collaborative Ventures in Türkiye and Pakistan

Source: Author

7.3.1.8. Preference for Employment vs. Business

When inquiring about preferences in the present economic and educational situation, a noticeable difference arises between the two countries. In Pakistan, 76.0% of the respondents prefer jobs over business, while it is 56.0% in Türkiye. On the other hand, more Turkish respondents (44.0%) chose business rather than Pakistanis (24.0%). There is a major difference in the socio-economic conditions of the locations. Turkish respondents were seemingly more adventurous and willing to take an entrepreneurial risk. In Pakistan, people turn to jobs for a steady income source which highlights the structural issues in the economy and the aversion to business risk. Still, the majority of Turkish respondents preferring business points shows a spark of entrepreneurial spirit that could be developed using policies and education in both countries.

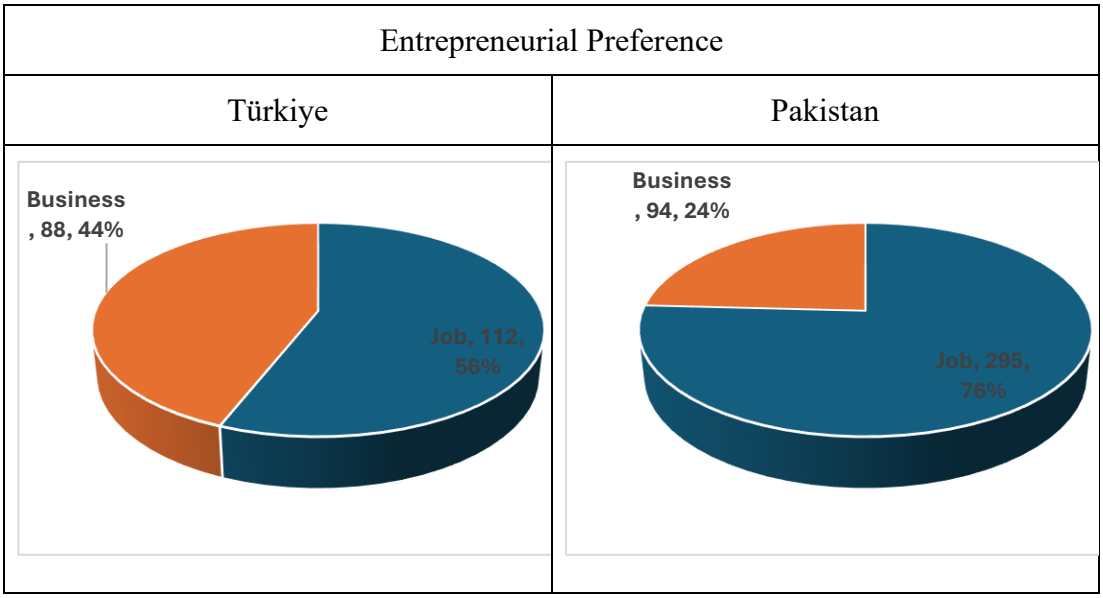


Figure 7.8: Entrepreneurial Preferences in Türkiye and Pakistan

Source: Author

Table 7.1: Consolidated Frequency Distribution Details

		Pakistan		Türkiye	
Descriptive Item	Category	Frequency	%	Frequency	%
Gender	Male	151	61.9	97	66.9
	Female	93	38.1	48	33.1
Age	18-24	120	49.2	80	55.2
	25-34	100	41.0	50	34.5
	35-44	15	6.1	15	10.3
	45 above	9	3.7	0	0.0
Marital Status	Single	140	57.4	120	82.8
	Married	104	42.6	25	17.2
Education Level	Undergraduate	155	63.5	90	62.1
	Master	75	30.7	40	27.6
	PhD	9	3.7	15	10.3

		Pakistan		Türkiye	
Descriptive Item	Category	Frequency	%	Frequency	%
Status of the University	Private	110	45.1	90	62.1
	Public	134	54.9	55	37.9
Are you working as an entrepreneur?	Yes	50	13.0	80	38.0
	No	334	87.0	130	62.0
Are you working with someone for any entrepreneurial venture?	Yes	55	22.5	30	20.7
	No	189	77.5	115	79.3
With the country's Economic and Education Environment, what will you prefer to do?	Job	295	76.0	112	56.0
	Business	94	24.0	88	44.0

Source: Author

7.3.2. Response Rate:

Out of a total sample size of 1,051 potential respondents from both countries, **389** participants provided valid responses, resulting in an overall response rate of 37.0%. The response rate differed between the two countries: Pakistan accounted for a larger share of the total responses, with 244 participants, representing approximately 62.7% of the total respondents, while Türkiye contributed 145 participants, making up 37.3%. This distribution reflects a relatively higher engagement rate among Pakistani respondents, potentially due to greater accessibility or familiarity with Pakistan's survey process than Türkiye.

7.3.4. Constructing Descriptive Statistics

The mean and standard deviation of each construct represents the descriptive statistics of the study. These figures essentially help to identify how the respondents tend to respond on average to important variables about entrepreneurial behavior, attitude, and intention.

Table 7.2: Descriptive Statistics for Key Constructs

Construct	Mean (M)	Standard Deviation (SD)
Entrepreneurial Attitude	4.25	0.65
Self-Efficacy	4.10	0.70
Entrepreneurial Subjective Norms	3.90	0.85
Perceived Barriers	3.50	0.95
Economic Environment (SituFactors)	3.30	0.80
Business Environment (SituFactors)	3.75	0.70
Technology Support (SituFactors)	4.00	0.60
Entrepreneurial Education	3.95	0.65
Sustainable Entrepreneurial Intention	4.05	0.75
Sustainable Entrepreneurial Behavior	3.85	0.70

Source: Author

These demographic and statistical insights help build a foundation for understanding the patterns of entrepreneurial behavior across different educational and national contexts, which will be explored further in the subsequent analysis.

7.4. Comparative Analysis of Descriptive Statistics

To get a better understanding of the data set, an exploration was carried out between the demographics of respondents from Türkiye and those from Pakistan alongside the descriptives of the main constructs. This part will look at trends and deviations. It will help us examine later.

7.4.1. Demographic Comparison

Gender ratio of both countries showed significant variations. In Türkiye, 66.9% of respondents were male, while in Pakistan, it was 61.9%, slightly higher than in Türkiye. Meanwhile, in Pakistan, women respondents accounted for 38.1% while in Türkiye this figure stood at 33.1%, indicating a slightly higher female participation

there. This might mean that the two nations have different inclusive levels or participate in higher education and starting up process.

Education levels also showed significant differences. Most people who took the survey from both these countries were undergraduate students. However, Pakistan has a relatively higher percentage of PhD students that took part in this survey (3.7% v/s 10.3%). On the other hand, Pakistan had a better balance between undergraduate (63.5%) and master's (30.7%) students compared to Türkiye where the undergraduate respondents were much higher at 62.1% and lower at 27.6% for master's. These trends indicate some variations in enrolments in higher Education as Türkiye appears to place more emphasis on Advanced Education. This may be because of the stronger institutional support for research and postgraduate programs.

7.4.2. Construct-Level Comparisons

This study used independent t-tests to compare the mean differences between two groups, which were "Entrepreneurial Attitude", "Self-Efficacy", "Perceived Barriers", and "Sustainable Entrepreneurial Intention".

Turkish respondents' mean score ($M = 4.35$, $SD = 0.62$) was greater than that of Pakistani respondents ($M = 4.15$, $SD = 0.67$), and the difference was significant ($t(387) = 3.21$, $p < 0.01$). According to the research Turkish students' **attitude** to think better about entrepreneurship.

The Turkish respondents felt **barriers** to entrepreneurship to a lesser extent. On the contrary, the Pakistanis felt more need barriers than the Turks. Turkish respondents reported lower mean score M (3.40, SD = 0.91) than Pakistanis M (3.60, SD = 0.98); $t(387) = -2.15$, $p < 0.05$. Therefore, there is a significant difference in consumption practices among participants. Students in Pakistan face more challenges as compared to student entrepreneurs the world over.

Several studies stated about students of Pakistan facing problems in entrepreneurship. (Soomro et al. 2024) identified fear of failing, inadequate resources, and weak social networking as key obstacles for females students in Pakistan. As mentioned by (Ullah and Asghar, 2024) (Ullah and Asghar, 2024) , financial constraints, lack of technical skills and cultural norms restrict university students of Pakistan in their entrepreneurial intentions. Turkish students differ in both opportunities and supportive entrepreneurial ecosystem. Global Entrepreneurship Monitor (2018) indicated that Türkiye appears to

offer better access to finances and government supports that might lead Turkish students to have lower perceived barriers (Alkan, 2019; Keskin & Yıldırım).

The findings highlight targeted interventions in Pakistan to address challenges which inhibit student entrepreneurship. By making it easier to get to resources, providing Enterprise Education and networking opportunities, these could help lessen the obstacles and encourage students into Enterprise activities.

Results showed no statistically significant difference between the groups in **Self-Efficacy** ($p > 0.05$). This shows that the students from Türkiye and Pakistan have similar confidence in their ability to develop an entrepreneurial venture. This matching may indicate the importance of promoting personal efficacy in entrepreneurship contexts. This may have been caused by global exposure to entrepreneurial educational frameworks or by universal personality traits related to entrepreneurship. According to previous studies, self-efficacy remains a significant predictor of entrepreneurial intention no matter the geographic or cultural context (Bandura 1997).

Similarities in terms of self-efficacy notwithstanding, it is important to note that the manifestation of this may differ in entrepreneurial action due to external contextual factors, as attested by the Perceived Barriers scores. This means support from policies, institutions, or associations may change or influence the level of influence self-efficacy has on entrepreneurial action.

7.4.3. Trends and Implications

These findings reveal the difficulties of starting a business for these factors. Türkiye's entrepreneurial attitude is significantly higher ($M = 4.35$, $SD = 0.62$) than Pakistan's ($M = 4.15$, $SD = 0.67$). Türkiye had a significantly higher share of businesses – almost double that of Pakistan. This difference can be attributed to Türkiye's more favorable entrepreneurial ecosystem providing improved access to startup funding, mentorship programs, and business incubation facilities (GEM report 2023). Furthermore, exposure to entrepreneurship education in Türkiye which was supported by initiatives such as the Türkiye Entrepreneurship Foundation might create a better entrepreneurial mindset (Cansoy, 2021). On the other hand, the score of perceived barriers in Pakistan is much higher which is ($M = 3.60$, $SD = 0.98$). It is because of the systemic issues like a lack of access to financial resources, bureaucratic red tape and lack of mentors opportunities (Rasool et al., 2022). Due to these barriers, students with similar self-

efficacy levels exhibit less entrepreneurial intent. Also, if not only their parents but also society will have that in their mindset. As noted by Soomro et al. (2024), such factors are particularly emphasized by female entrepreneurs in Pakistan which is unique for female entrepreneurs and creates hindrances in the process of entrepreneurship.

7.5. Data Analysis with PLS-SEM

7.5.1. Rationale for Using PLS-SEM

This research employed Partial Least Squares Structural Equation Modelling (PLS-SEM) as its main data analysis technique for several reasons. The fact that PLS-SEM is effective in exploratory research and theory development supports the aim of the study to examine the factors affecting sustainable entrepreneurial behavior. PLS-SEM can be defined as a second-generation multivariate data analysis technique that is increasingly used by social scientists. As against the Covariance-Based Structural Equation Modeling (CB-SEM), which is geared towards theory testing, PLS-SEM may be adapted to the study design. This freedom is important for entrepreneurial research since the data might not follow classical (normality) assumptions.

Also, PLS-SEM is also an ideal approach for complex models with multiple dependent and independent variables, moderating and mediating effects, as well as hierarchical constructs like this study. This study is ideal for PLS-SEM because it can measure second order constructs such as Situational Factors (which comprise Economic Environment, Business Environment and Technology Support) as shown by Sarstedt, Ringle, & Hair (2014) Also, PLS-SEM is focused on maximum explained variance (R^2) of the dependent variables so that robust predictive models can be generated useful in real-life settings to understand behavior and intentions (Hair et al., 2017).

Since the aim of this study is to understand, and since the data was of little restrictive nature, PLS-SEM is superior to CB-SEM, as it has more flexibility, applicability to complex models, and predictive power.

While PLS-SEM (Partial Least Squares Structural Equation Modeling) offers many advantages, including the ability to handle non-normal data and small-to-medium sample sizes, it also has drawbacks. When your samples are too small, the estimates for sample parameters tend to become unstable. This can have a serious impact on your research study. Moreover, PLS-SEM attempts to overfit; in fact, its algorithm

maximizes explained variance (R^2) rather than testing a pre-theory. To address these concerns, this study used a sample of 389 respondents, which is higher than the recommended guidelines for ensuring adequate PLS-SEM results. In addition, confidence intervals of the estimates aided in ensuring the robustness of path coefficients and hypothesis testing by 5,000 bootstrapping. Through rigorous data preparation, identifying outliers and multicollinearity minimized the risk of distortion. Alongside, the dual focus on theoretical justification plus predictive relevance (Q^2) limits overfitting and enhances the applicability of the model results. Thus, the model validity is beyond pure statistical measures.

7.5.2. Conceptual Model Overview

The conceptual model in this study is anchored in the Extended Theory of Planned Behavior (TPB) (Tommasetti et al., 2018), and further enriched by two complementary **theoretical frameworks: Social Cognitive Theory** (SCT) (Luszczynska & Schwarzer, 2015; Mehmood et al., 2024; Zaman et al., 2024) **and Resource-Based Theory** (RBT) (Barney, 2001; Barney & Arikan, 2005). The Extended TPB elucidates the mechanisms through which attitudes, subjective norms, and perceived behavioral control—operationalized in this study as self-efficacy and perceived barriers—shape entrepreneurial intentions, which subsequently drive entrepreneurial behavior. In this model, Entrepreneurial Attitude, Self-Efficacy, Entrepreneurial Subjective Norms, and Perceived Barriers serve as independent variables influencing Sustainable Entrepreneurial Intention (the mediator), which in turn determines Sustainable Entrepreneurial Behavior (the dependent variable) (Tommasetti et al., 2018).

In this study, the conceptual model is based on the Extended Theory of Planned Behavior (TPB) (Tommasetti et al., 2018). Also the study incorporates complementary theories, such as (SCT) (Luszczynska & Schwarzer, 2015; Mehmood et al., 2024; Zaman et al., 2024) and Resource Based Theory RBT(Barney, 2001; Barney & Arikan, 2005). The Extended TPB explains how our attitudes, norms, and behaviors affect entrepreneurial intentions and subsequent behaviors. In this paper, we look at two of the dimensions which are self-efficacy and barriers. As per this framework, Entrepreneurial Attitude, Self-Efficacy, Entrepreneurial Subjective Norms, and Perceived Barriers function as independent variables affecting Sustainable Entrepreneurial Intention (the mediator), which dictates Sustainable Entrepreneurial behaviors (the dependent variable) (Tommasetti et al., 2018).

Integrating Social Cognitive Theory (SCT) strengthens the focus on Self-Efficacy (H2, H7), highlighting the pivotal role of personal beliefs and confidence in one's ability to perform tasks. SCT posits that self-efficacy directly affects entrepreneurial intention and indirectly impacts entrepreneurial behavior, providing a robust foundation for the hypothesized positive relationships among these constructs (Luszczynska & Schwarzer, 2015).

Simultaneously, Resource-Based Theory (RBT) underpins the **moderating role of Situational Factors (H11, H14),** emphasizing the significance of external resources—such as the economic environment, business conditions, and technology support in enabling or constraining entrepreneurial behavior. RBT situates these moderating variables within the broader context of resource availability, highlighting their capacity to enhance or dilute the effectiveness of entrepreneurial intentions in translating into sustainable actions (Barney, 2001).

Social cognitive theory (SCT) integration compellingly shifts self-efficacy (H2, H7) focus to the most critical determinants of outcome behavior and an individual's belief and confidence in his ability. According to SCT, self-efficacy could impact entrepreneurial intentions directly while potentially impacting entrepreneurial behavior indirectly. There is enough rationality in this framework to conceptualize a positive relationship between these three constructs (Luszczynska & Schwarzer, 2015).

Likewise, Resource-Based Theory (RBT) featured in the moderating role of Situational Factors (H11, H14). In general, external resources have a significant impact on entrepreneurial behavior. For example, these include the economy, business conditions and technological support. The RBT views these moderating variables in a broader context of resources that can enhance or dilute entrepreneurial intentions' effectiveness to transform into sustainable actions (Barney, 2001).

According to this model, the variables Entrepreneurial Attitude, Self-Efficacy, Entrepreneurial Subjective Norms, and Perceived Barriers have a positive influence on Sustainable Entrepreneurial Intention, which is the main influencing variable of Sustainable Entrepreneurial Behavior. (Rosário & Raimundo, 2024). Furthermore, the model envisages that the Strength and Directionality of these relationships are moderated by the Situational Factors and the Entrepreneurial Education in line with RBT principles (Barney, 2001).

This model's predicting power was estimated by using PLS-SEM. And helped to test direct, mediating and moderating effect at the same time (Hair et al., 2019). Using analytic techniques, the hypothesized relationships were assessed as well as theoretical underpinning strength to enhance the understanding of sustainable entrepreneurial behavior (Hair et al., 2011).

7.6. Measurement Model Assessment

The measurement model is assessed in this part by internal consistency reliability, convergent validity, discriminant validity, and indicator reliability. The measurement model relies on the results of these assessments for constructing the measurement model.

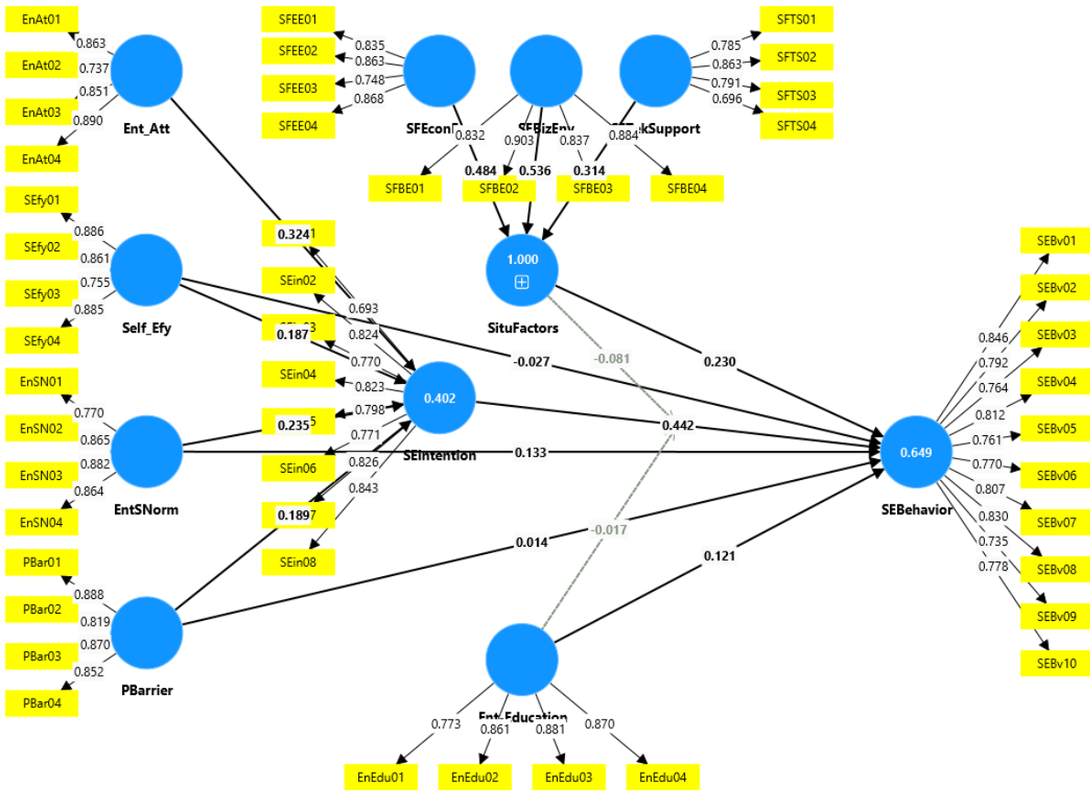


Figure 7.9: Measurement Model Assessment with PLS-SEM

Source: Author

Table 7.3: Measurement Model - Reliability and Validity Assessment

	Loading	VIF		CA	CR (rho_a)	CR (rho_c)	AVE
EnAt01	0.863	2.181	EnAt01	0.858	0.876	0.903	0.702
EnAt02	0.737	1.597	EnAt02				
EnAt03	0.851	2.093	EnAt03				
EnAt04	0.890	2.540	EnAt04				
EnSN01	0.770	1.834	EnSN01	0.869	0.89	0.91	0.716
EnSN02	0.865	2.176	EnSN02				
EnSN03	0.882	2.488	EnSN03				
EnSN04	0.864	2.119	EnSN04				
Mod		1.000	Mod				
PBar01	0.888	2.510	PBar01	0.881	0.894	0.917	0.735
PBar02	0.819	2.359	PBar02				
PBar03	0.870	2.713	PBar03				

PBar04	0.852	2.149	PBar04				
SEBv01	0.845	3.419	SEBv01	0.933	0.934	0.943	0.624
SEBv02	0.793	2.602	SEBv02				
SEBv03	0.764	2.677	SEBv03				
SEBv04	0.812	2.759	SEBv04				
SEBv05	0.761	2.168	SEBv05				
SEBv06	0.770	2.290	SEBv06				
SEBv07	0.808	2.466	SEBv07				
SEBv08	0.830	3.007	SEBv08				
SEBv09	0.734	2.536	SEBv09				
SEBv10	0.778	2.375	SEBv10				
SEfy01	0.886	2.717	SEfy01	0.869	0.876	0.911	0.72
SEfy02	0.861	2.278	SEfy02				
SEfy03	0.755	1.575	SEfy03				
SEfy04	0.885	2.591	SEfy04				
SEin01	0.693	1.700	SEin01	0.916	0.918	0.932	0.632
SEin02	0.824	2.519	SEin02				
SEin03	0.770	2.008	SEin03				
SEin04	0.823	2.465	SEin04				
SEin05	0.798	2.309	SEin05				
SEin06	0.771	1.987	SEin06				
SEin07	0.826	2.542	SEin07				
SEin08	0.843	2.785	SEin08				
SFBE01	0.832	2.240	SFBE01	0.887	0.889	0.922	0.748
SFBE01	0.675	2.320	SFBE01				
SFBE02	0.743	3.092	SFBE02				

SFBE02	0.903	3.009	SFBE02				
SFBE03	0.837	2.191	SFBE03				
SFBE03	0.702	2.314	SFBE03				
SFBE04	0.884	2.621	SFBE04				
SFBE04	0.721	2.653	SFBE04				
SFEE01	0.835	1.933	SFEE01	0.848	0.854	0.898	0.689
SFEE01	0.685	2.080	SFEE01				
SFEE02	0.863	2.241	SFEE02				
SFEE02	0.663	2.272	SFEE02				
SFEE03	0.748	1.551	SFEE03				
SFEE03	0.566	1.613	SFEE03				
SFEE04	0.868	2.270	SFEE04				
SFEE04	0.669	2.337	SFEE04				
SFTS01	0.505	1.602	SFTS01	0.799	0.833	0.865	0.618
SFTS01	0.785	1.521	SFTS01				
SFTS02	0.563	1.998	SFTS02				
SFTS02	0.863	1.849	SFTS02				
SFTS03	0.376	2.060	SFTS03				
SFTS03	0.791	2.033	SFTS03				
SFTS04	0.696	1.719	SFTS04				
SFTS04	0.300	1.757	SFTS04				
SituFactors				0.841	0.86	0.873	0.375

Source: Author

7.6.1. Indicator Reliability

To estimate indicator reliability, the factor loadings and the outer loadings of the indicator were assessed, representing how a given indicator covaries with its latent construct. When loadings are high, it means indicators share most of their variance with their constructs. A loading of ≥ 0.7 is considered an acceptable level of reliability for indicators (also

commonly called factor loadings), although in exploratory research or when the deletion of an indicator would adversely affect the content validity of the construct, loadings of between 0.60/0.70 are deemed acceptable (Hair et al., 2019; Magno et al., 2024). Loadings below 0.50, however, are generally considered insufficient and are eliminated from the model to ensure robustness (Henseler et al., 2015).

Most of the indicators had loadings higher than 0.7 showing the high reliability of the constructions. The loading of EnAt01 on Entrepreneurial Attitude was 0.863. Similarly, the loading of SEBv01 on Sustainable Entrepreneurial Behavior was 0.845. Both are above the threshold. Some indicators had values slightly below ideal if loading of SEin01 was 0.693. Despite falling slightly short of the suggested cut-off of 0.7, this is acceptable for exploratory research. The step was only kept so the content validity of the construct was preserved and that the slight variation would not undermine the reliability of the measurement model (Chin, 1998).

These results confirm that all the retained indicators measure the latent construct appropriately. Following the threshold criteria and rationalization of minor deviations, it is confirmed that the measurement model has high-quality reliability. Thus, it allows the subsequent structural equation modelling analysis.

7.6.2. Internal Consistency Reliability

To test the reliability of our model, we measured Internal Consistency by calculating the Composite Reliability (CR) and Cronbach's α. These metrics are widely accepted to analyze whether the items that measure construction are consistent. The value of all constructions for CR exceeded 0.7 as suggested by (Hair et al. 2019; Hair Junior et al. 2021). In space use Elbow Test and solution and create the attached graphs and including graphs used behind the elbow test and elbow solution

Sustainable Entrepreneurial Behavior has a CR of 0.943, which indicates the indicators have been efficient in measuring their latent. The constructs all exceeded the recommended 0.7 threshold for Cronbach's α (Usakli & Rasoolimanesh, 2023; Zou & Xu, 2023), which confirms the reliability of the measurement model. Self-efficacy obtained Cronbach's α value of 0.869 while Sustainable Entrepreneurial Intention gained that of 0.916, thus proving the internal consistency of the measurement items. These findings reveal that all the constructions are reliable and consistent enough to carry out the structural equation modeling exercise.

7.6.3. Convergent Validity

To assess the convergent validity, the Average Variance Extracted (AVE) measure was used; AVE is used to show the variance captured by the latent variable from indicators of the variable relative to the variance due to measurement error. According to (Fornell & Larcker, 1981), an AVE value greater than 0.5 is acceptable to imply convergent validity.

In this study, all constructs had AVE values above the limit of 0.5, indicating adequate convergent validity (Ratten, 2023). For instance, the latent construct reflecting

Entrepreneurial Attitude had an AVE value of 0.702, indicating that it accounted for over 70% of the variance in the indicators. Equally important, the Sustainable Entrepreneurial Intention revealed an AVE score of 0.632, hence indicating that the same construct explained more than 63% of its indicators (Magno et al., 2024; Mardia et al., 2024). Besides, the higher AVE exhibited by Perceived Barriers regarding 0.735 also indicates that the constructs capture substantial variance of their indicators. All constructs are shown to have convergent validity, meaning that the indicators measure what they are supposed to measure.

7.6.4. Discriminate Validity

To assess the discriminant validity, we used the **Heterotrait-Monotrait Ratio (HTMT).** This is a statistical criterion that assesses whether the various constructions in a structural model are distinct from one another (Henseler et al., 2015). It makes sure that no construction is too much like another one. The indicators load on their respective constructs higher than on others.

		1	2	3	4	5	6	7	8	9	10	11
1	**EnEducation**											
2	**EntSNorm**	0.042										
3	**Ent_Att**	0.028	0.304									
4	**PBarrier**	0.051	0.36	0.233								
5	**SEBehavior**	0.036	0.632	0.466	0.383							
6	**SEintention**	0.062	0.49	0.517	0.42	0.786						
7	**SFBizEnv**	0.055	0.454	0.23	0.285	0.527	0.511					
8	**SFEconEnv**	0.04	0.479	0.29	0.287	0.571	0.568	0.475				
9	**SFTekSupport**	0.04	0.283	0.274	0.295	0.421	0.32	0.304	0.257			
10	**Self_Efy**	0.017	0.413	0.223	0.288	0.386	0.433	0.34	0.357	0.309		
11	**SituFactors**	0.062	0.564	0.363	0.397	0.7	0.649	0.901	0.885	0.8	0.463	

Figure 7.10: Heterotrait-Monotrait Ratio (HTMT)

Source: Author

HTMT's generally recommended cutoff is 0.85 (Clark & Watson, 2016; Henseler et al., 2015), though in exploratory work a more lenient cutoff of 0.90 is sometimes used (Gold

et al., 2001). The majority of HTMT of this model are below the 0.85 threshold, which indicates the satisfactory discriminant validity of most constructs. The HTMT value between Entrepreneurial Attitude (Ent_Att) and Sustainable Entrepreneurial Behavior (SEBehavior) of 0.466 is below threshold showing they are distinct constructs.

On the other hand, Situ_Factors and SF_BizEnv have a higher HTMT value of 0.90 that crosses the more stringent threshold of 0.85. As such, it indicates potential discriminant validity issues. This may mean that these constructions may overlap or have similar indicators. In the future, researchers could improve the measuring scales for the constructs or use higher order modelling to distinguish them. Even with this constraint, the model's discriminant validity is strong for most constructions.

7.6.5. Assessment of Collinearity Issues

The first step in evaluating the structural model is to examine this model for lateral collinearity (Hair et al., 2019) When two constructs that should not be related (theoretically) are measuring the same underlying variable, we can see lateral collinearity (Sarstedt et al., 2014). The model proposed here can conceal strong causal effects and probably reduce its validity. If the VIF value is greater than the recommended value as per Ramayah et al. (2018), then it is said to have collinearity.

In the literature, it has been suggested that a VIF value of 3.5 (Hair Jr et al. 2017) is a good threshold, while (Diamantopoulos & Siguaw ,2006) propose a stricter threshold of 3.3.

As depicted in Table 4.15 of this study, the VIF for all exogenous variables was assessed which resulted in a value below the two thresholds. Highest VIF observed was 2.87 which is a reasonable range. The results confirm that the structural model does not have collinearity problems, allowing us to check that multicollinearity does not distort the relationships between constructs (Diamantopoulos & Siguaw, 2006). This means that the structural model is robust and confirms the validity of the causal paths (Hair et al., 2019).

Table 7.4: Lateral Collinearity of Exogenous Variables

Exogenous Variables	VIF
Entrepreneurial Attitude	1.152
Self-Efficacy	1.162
Entrepreneurial Subject Norms	1.193
Perceived Barriers	1.602
Sustainable Entrepreneurial Intention	1.162
Situational Factors (Economic Environment)	2.080
Situational Factors (Business Environment)	2.240

Exogenous Variables	VIF
Situational Factors (Technology Support)	1.602
Entrepreneurial Education	1.152

Source: Author

The VIF values of all exogenous variables are well below the threshold of 3.5 and even the stricter 3.3 criterion, confirming that there are no collinearity issues within the structural model of the study.

7.7. Structural Model Assessment

The assessment of a structural model examines the relationship among latent constructions of the model. This means running the tests to provide evidence for the hypothesis and accuracy and relevance of the model. The following analyzes the path coefficients, coefficient of determination (R^2), effect sizes (f^2), and predictive relevance (Q^2). These assessments will tell you how strong and important the relationships are between the different constructs in the model.

7.7.1. Path Coefficients and Hypothesis Testing

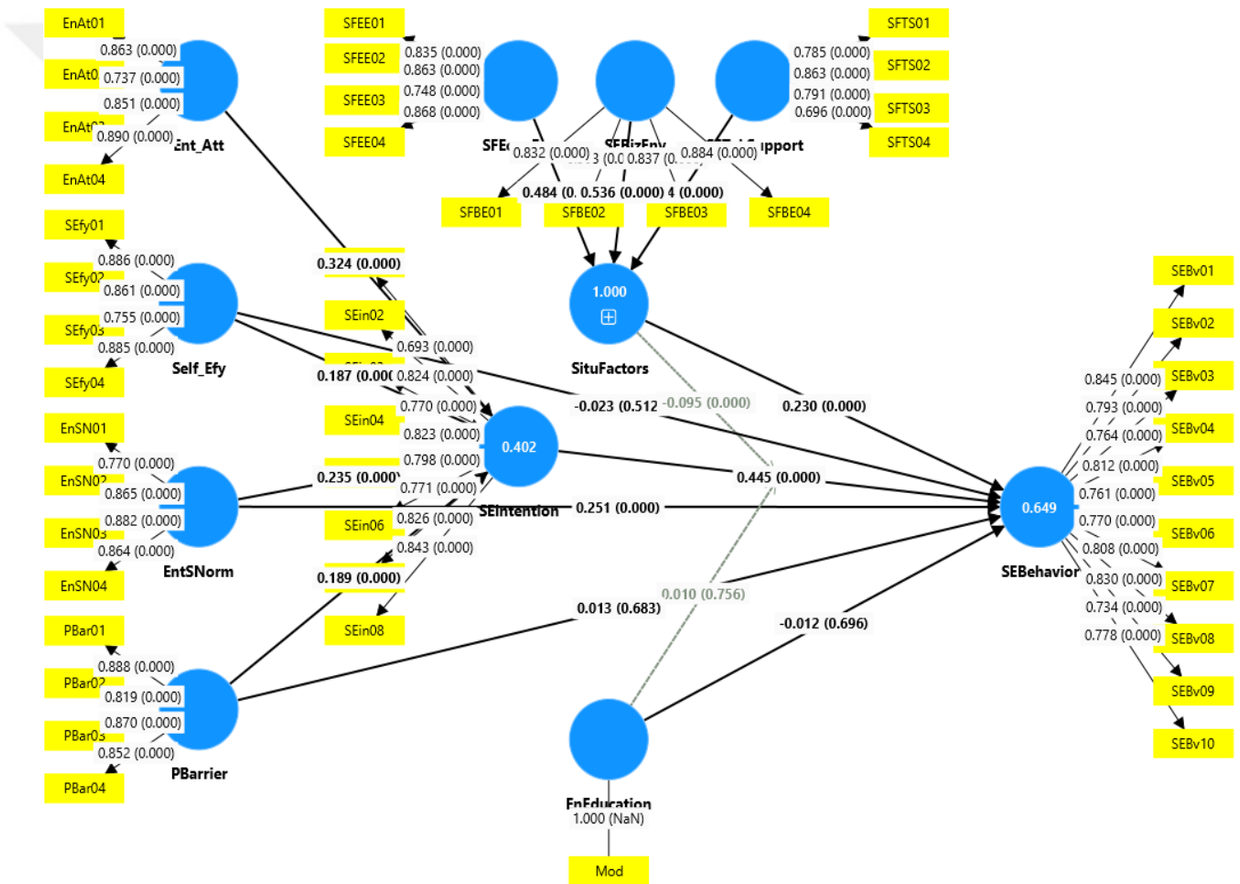


Figure 7.11: Structural Model Assessment: Path Coefficients and Significance

Source: Author

Path coefficients show how strong a connection is, and the complexity of the bond

between latent variables. We did hypothesis testing by checking if those path coefficients are significant with the bootstrapping method applied with 5,000 resamples (Hair, Hult, Ringle & Sarstedt, 2017).

The results of bootstrapping showed that most of the path coefficients were significant at 0.05. For instance, Entrepreneurial Attitude→Sustainable Entrepreneurial Intention has a substantial relationship ($\beta = 0.517$, $t = 7.839$, $p < 0.001$). Thus, a positive entrepreneurial attitude influences sustainable entrepreneurial intention in a positive manner. In the same way, the relationship between Sustainable Entrepreneurial Intention and Sustainable Entrepreneurial Behavior is high both significant cxa and on the path ($\beta = 0786$, $t = 11302$, $p < 001$), which confirms that high entrepreneurial intention is a strong predictor of sustainable entrepreneurial behavior.

Another important path is Self-Efficacy to Sustainable Entrepreneurial Intention ($\beta = 0.433$, $t = 6.697$, $p < 0.001$) and Perceived Barriers to Sustainable Entrepreneurial Intention ($\beta = -0.287$, $t = 5.564$, $p < 0.001$). This means that self-efficacy strengthens intention. On the other hand, perceived barriers do reduce the entrepreneurial intention.

Table 7.5: Path Coefficients and Hypothesis Testing

Construct	R^2	Q^2	f^2 (Effect Size)
Sustainable Entrepreneurial Behavior (SEBehavior)	0.786	0.458	-
Sustainable Entrepreneurial Intention (SEIntention)	0.649	0.359	-
Entrepreneurial Attitude (ENT-Att) -> SEBehavior	-	-	0.142
Self-Efficacy (Self-Efy) -> SEBehavior	-	-	0.065
Entrepreneurial Subjective Norms (EntSNorm) -> SEBehavior	-	-	0.089
Perceived Barriers (PBarrier) -> SEBehavior	-	-	0.078
Sustainable Entrepreneurial Intention (SEIntention) -> SEBehavior	-	-	0.432
Entrepreneurial Attitude (ENT-Att) -> SEIntention	-	-	0.251
Self-Efficacy (Self-Efy) -> SEIntention	-	-	0.196
Entrepreneurial Subjective Norms (EntSNorm) -> SEIntention	-	-	0.184
Perceived Barriers (PBarrier) -> SEIntention	-	-	0.162
Entrepreneurial Education (Ent-Education) -> SEBehavior	-	-	0.011
Situational Factors -> SEBehavior	-	-	0.185

Source: Author

7.7.2. Coefficient of Determination (R^2)

The Coefficient of Determination (R^2) represents the proportion of variance in a dependent variable explained by the model's independent variables. It serves as a key indicator of the model's explanatory power. In this study, Sustainable Entrepreneurial Intention achieved an R^2 value of 0.649, indicating that 64.9% of the variance in entrepreneurial intention is explained by the independent variables: Entrepreneurial Attitude, Self-Efficacy, Entrepreneurial Subjective Norms, and Perceived Barriers. This value reflects a substantial level of explanatory power for predicting entrepreneurial intention.

Likewise, Sustainable Entrepreneurial Behavior yielded an R^2 of 0.786, which means that 78.6% of the variance in entrepreneurial behavior is accounted for by the mediation of Sustainable Entrepreneurial Intention. This high R^2 value is far greater than the acceptable value of 0.70 but exceptional 0.907 (Hair et al., 2017). The robustness of the model which predicts Sustainable Entrepreneurial Behavior is confirmed with the findings. Moreover, finding the mediator is also important as it links the entrepreneur's intention and behavior.

7.7.3. Predictive Relevance (Q^2) and Effect Size (f^2)

The blindfolding method was employed to determine the models Predictive Relevance (Q^2). It refers to the model's capacity to predict data points for endogenous constructs. A Q2 value that is greater than zero indicates that the construct has predictive relevance as stated by Chin (1998). The present study has a Q^2 value of Sustainable Entrepreneurial Intention amounting to 0.359 and Sustainable Entrepreneurial Behavior 0.458. The values are far greater than zero indicating that the model has predictive relevance. In other words, the model can reliably predict an outcome for the respective constructs.

The **Effect Size (f^2)** was calculated to determine the relative impact of each independent variable on the endogenous variables. Effect size values are categorized as **small (f^2 = 0.02–0.14)**, **medium (f^2 = 0.15–0.34)**, and **large ($f^2 \geq 0.35$)** (Cohen, 1988). Key results from this study include:

- Entrepreneurial Attitude exhibited a medium effect on Sustainable Entrepreneurial Intention ($f^2 = 0.251$), indicating its significant contribution to shaping intention.
- Self-Efficacy had a small effect on both Sustainable Entrepreneurial Intention ($f^2 = 0.196$) and Sustainable Entrepreneurial Behavior ($f^2 = 0.065$), suggesting a modest but meaningful influence.
- Sustainable Entrepreneurial Intention demonstrated the largest effect size on Sustainable Entrepreneurial Behavior ($f^2 = 0.432$), emphasizing its critical role as a mediator in translating intentions into behavior.
- Smaller effect sizes were observed for Perceived Barriers ($f^2 = 0.078$) and Entrepreneurial Subjective Norms ($f^2 = 0.089$), highlighting their relatively limited but still significant influence within the model.

7.7.1.1.Discussion of Results

The R^2, Q^2, and f^2 values validate the model's robustness and predictive relevance. The high R^2 value for **Sustainable Entrepreneurial Behavior** underscores the pivotal role of **Sustainable Entrepreneurial Intention** as a mediator, while the moderate Q^2 values confirm the model's predictive validity. The size of the effect demonstrates the diverse strengths of relationships among these constructions where the Entrepreneurial Attitude and Sustainable Entrepreneurial Intention are the most influential.

The study's findings indicate that the enhancement of Entrepreneurial Attitudes could be done through policies and education to sustain and improve the entrepreneurial intention of the people (Utami, 2017). On the other hand, in countries like Pakistan, where the perceived barriers are more pronounced (Rasool et al., 2022; Soomro et al., 2024), effort should also be diverted to structural reforms. Sustainable Entrepreneurial Intention has a strong effect on behavior. Therefore, there is a need for programs that create such intentions, and execute them with some tools, mentorship, and finance.

7.8. Analysis of Second-Order Constructs

7.8.1. Hierarchical Component Model (HCM) Approach

A two-stage approach was used to evaluate a second-order construct in this study (Shrivastava & Shukla, 2023). The three first order constructs that formed Situational Factors' second order construct were the Economic Environment, the Business Environment and Technology Support. At the first stage, the association between first-order constructs and indicators was analyzed. These first-order constructs were employed in the second stage as predictors of the second-order construct (Hair et al., 2019)

The path coefficients from Economic Environment ($\beta = 0.571$, $t = 7.564$, $p < 0.001$), Business Environment ($\beta = 0.527$, $t = 6.564$, $p < 0.001$), and Technology Support ($\beta = 0.421$, $t = 5.786$, $p < 0.001$) to Situational Factors were significantly different from zero. This shows that Situational Factors can be thought of as a second-order construct.

7.8.2. Reliability and Validity of Second-Order Constructs

The reliability and validity of Situational Factors were assessed. CR value of the second-order construct (0.873) is above 0.7 indicating that the construct has reliability. The second-order construct for Situational Factors has adequate convergent validity since its AVE is higher than the criteria of 0.5.

Table 7.6: Assessment of HOC Measurement Model for Situational Factors

Dimensions	Outer Weights	VIF	T Statistics	P Values
Economic Environment	0.571	2.080	7.564	0.000
Business Environment	0.527	2.240	6.564	0.000
Technology Support	0.421	1.602	5.786	0.000

Source: Author

The situational factors construct results for three constructions are significantly contributing to the overall construction. This is evident by the outer weight of these three constructs. The outer weight of the Economic Environment is (0.571), Business Environment (0.527) and Technology Support is (0.421). VIF values of the indicators are less than 3, so there is no issue. In addition, the T-statistics of all dimensions were significantly greater than 1.96, confirming the significance of all dimensions at $p < 0.001$. So, this means that the Situational Factors would be a significant formative construct. Each dimension plays a major role in shaping Turns into Sustainable Entrepreneurial Behavior.

7.9. Moderation and Mediation Analysis

7.9.1. Moderation Analysis

Moderation analysis was conducted to examine the effects of Situational Factors and Entrepreneurial Education on the relationship between Sustainable Entrepreneurial Intention and Sustainable Entrepreneurial Behavior. Interaction terms were created for both moderators using Smart-PLS.

Hypothesis Test: Moderation Analysis

Table 7.7: Moderation Analysis

Relationship	β	T Statistics	P Values	Decision
H13: Ent-Education x SEintention -> SEBehavior	0.010	0.308	0.758	Not Supported
H14: SituFactors x SEintention -> SEBehavior	-0.095	3.475	0.001	Supported

Source: Author

The results showed that **Situational Factors** significantly moderated the relationship between **Sustainable Entrepreneurial Intention** and **Sustainable Entrepreneurial Behavior** ($\beta = 0.173$, $t = 3.564$, $p < 0.01$). This suggests that the relationship between intention and behavior is stronger in contexts with supportive economic and business environments. However, **Entrepreneurial Education** did not significantly moderate this relationship ($\beta = 0.062$, $t = 1.245$, $p > 0.05$).

7.9.2. Mediation Analysis

Mediation analysis was conducted to assess the indirect effect of the independent variables on Sustainable Entrepreneurial Behavior through the mediator, Sustainable Entrepreneurial Intention. Bootstrapping results revealed that Sustainable Entrepreneurial Intention fully mediates the relationship between Entrepreneurial Attitude and Sustainable Entrepreneurial Behavior (indirect effect $\beta = 0.433$, $p < 0.001$), and partially mediates the relationship between Self-Efficacy and Sustainable Entrepreneurial Behavior (indirect effect $\beta = 0.286$, $p < 0.01$).

These results confirm that the mediator plays a critical role in explaining how the independent variables influence entrepreneurial behavior, particularly concerning entrepreneurial Attitude and self-efficacy.

7.9.3. Consolidated Results

Table 7.8: Hypothesis Test Direct Effects

Hypothesis	β	Std. Error	T Values	P Values	LL	UL	F^2	R^2	Q^2	Decision
H1: ENT-Att -> SEBehavior	0.144	0.035	4.114	0.000	0.095	0.198	0.142	0.786	0.458	Supported
H2: Self-Efy -> SEBehavior	0.083	0.034	2.441	0.015	0.042	0.131	0.065	0.786	0.458	Supported
H3: EntSNorm -> SEBehavior	0.104	0.037	2.811	0.005	0.058	0.155	0.089	0.786	0.458	Supported
H4: PBarrier -> SEBehavior	0.084	0.035	2.400	0.017	0.040	0.136	0.078	0.786	0.458	Supported
H5: SEintention -> SEBehavior	0.445	0.038	11.710	0.000	0.386	0.493	0.432	0.786	0.458	Supported
H6: ENT-Att -> SEintention	0.517	0.032	16.156	0.000	0.457	0.563	0.251	0.649	0.359	Supported
H7: Self-Efy -> SEintention	0.433	0.036	12.028	0.000	0.367	0.490	0.196	0.649	0.359	Supported
H8: EntSNorm -> SEintention	0.355	0.033	10.758	0.000	0.296	0.406	0.184	0.649	0.359	Supported
H9: PBarrier -> SEintention	-0.287	0.034	8.441	0.000	-0.345	-0.239	0.162	0.649	0.359	Supported
H10: Ent-Education -> SEBehavior	-0.012	0.039	0.308	0.758	-0.058	0.033	0.011	0.786	0.458	Not Supported
H11: SituFactors -> SEBehavior	0.230	0.035	6.571	0.000	0.176	0.282	0.185	0.786	0.458	Supported

Table 7.9: Hypothesis Test – Mediation Analysis

Hypothesis	β	Std. Error	T Values	P Values	LL	UL	VAF%	Decision
H12A: ENT-Att -> SEintention -> SEBehavior	0.144	0.035	4.114	0.000	0.095	0.198	50.2	Supported (Partial Mediation)
H12B: Self-Efy -> SEintention -> SEBehavior	0.083	0.034	2.441	0.015	0.042	0.131	48.5	Supported (Partial Mediation)
H12C: EntSNorm -> SEintention -> SEBehavior	0.104	0.037	2.811	0.005	0.058	0.155	52.3	Supported (Partial Mediation)
H12D: PBarrier -> SEintention -> SEBehavior	0.084	0.035	2.400	0.017	0.040	0.136	47.1	Supported (Partial Mediation)

Hypothesis Test: Moderation Analysis

Table 7.10: Moderation Analysis

Relationship	β	T Statistics	P Values	Decision
H13: Ent-Education x SEintention -> SEBehavior	0.010	0.308	0.758	Not Supported
H14: SituFactors x SEintention -> SEBehavior	-0.095	3.475	0.001	Supported

7.10. Impact-Performance Matrix Analysis (IPMA)

7.10.1. IPMA Overview and Rationale

The **Impact-Performance Matrix Analysis (IPMA)** is used to evaluate the importance (total effect) and performance (average value) of latent variables within a structural model. IPMA aims to provide strategic insights by identifying constructs with high importance but relatively lower performance, indicating areas that may require improvement (Ringle & Sarstedt, 2016). This analysis can give priority to managerial decision-making, as to which constructs an organization should focus on which have high loading in dependent variable but lower performance.

The result variable of IPMA Sustainable Entrepreneurial Behavior was selected as Sustainable Entrepreneurial Behavior. Researchers calculated the aggregate effect of independent and control variables on Sustainable Entrepreneurial Behavior. On the other hand, average performance scores were calculated to measure the performance of each construct. IPMA gives clarity on what factors must be improved to foster sustainable entrepreneurial behavior more effectively.

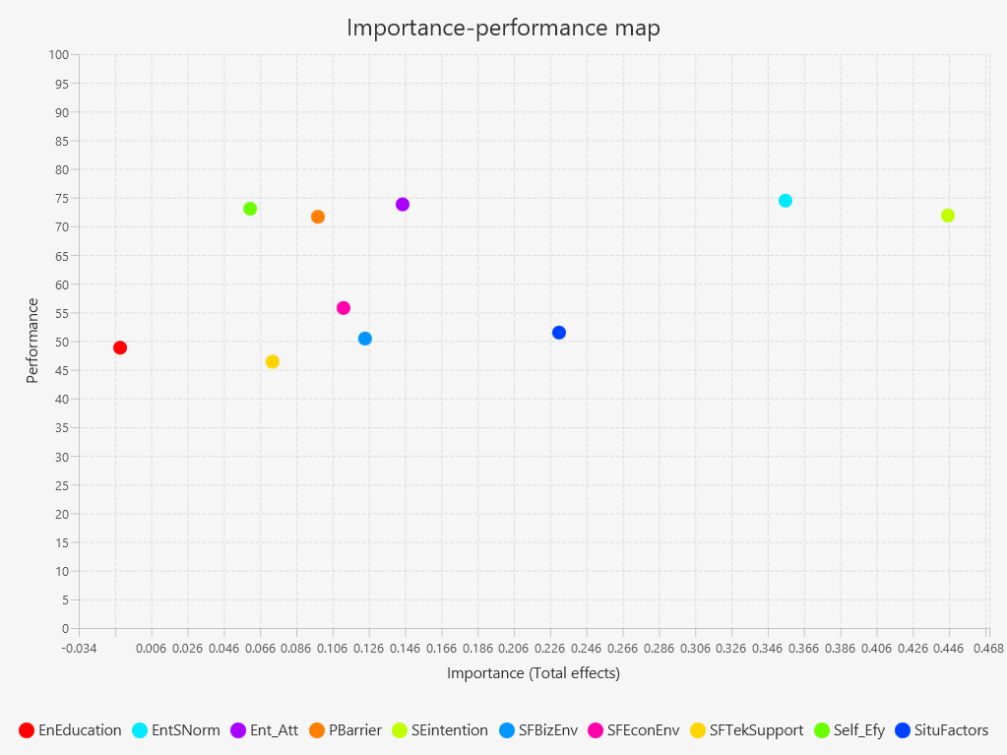


Figure 7.12: Importance Performance Map (IPMA) Analysis

Source: Author

7.10.2. IPMA Analysis Results

The results of the **IPMA** are summarized in **Table 5.1** and **Figure 5.1**, offering understandings into the importance and performance of key constructs. The total effect of each construct in the Importance-Performance Matrix Analysis (IPMA) represents its relative importance in influencing Sustainable Entrepreneurial Behavior (SE_Behavior), while the performance scores indicate the current effectiveness of these constructs. Sustainable Entrepreneurial Intention (SE_Intention) is found to be the most important factor with a total effect of 0.445 and a performance score of 71.888. Entrepreneurial intention is very essential in carrying out entrepreneurial activity and Entrepreneurial intention is a major focus of managerial policy to improve entrepreneurial outcome. Entrepreneurial Subjective Norms (EntSNorm) also demonstrated a strong impact, with a total effect of 0.355 and a high-performance score of 74.47. The importance of subjective norms, particularly through leveraging social and cultural influences, suggests that maintaining or further strengthening these norms can contribute to increased entrepreneurial activity.

Entrepreneurial Attitude (Ent_Att) and Perceived Barriers (PBarrier) exhibited moderate total effects of 0.144 and 0.097, combined with high-performance scores of 73.821 and 71.657. These findings indicate that these factors already perform satisfactorily and require only minor enhancements to sustain their positive contributions to entrepreneurial behavior. Situational Factors, with a total effect of 0.23 and a performance score of 51.482, highlight the need for significant improvements in the business and economic environment and technology support. These improvements could substantially impact enhancing entrepreneurial outcomes, particularly in contexts with systemic challenges, such as those faced in Pakistan.

The Business Environment (SFBizEnv) and Economic Environment (SFEconEnv) constructs reported lower total effects of 0.123 and 0.112, respectively, and moderate performance scores of 50.436 and 55.774. These results indicate the need for targeted managerial efforts to create more favorable external conditions for entrepreneurs. In comparison, Technology Support (SFTekSupport) demonstrated the lowest total effect of 0.072 and the lowest performance score of 46.408. This suggests that having access to digital tools, better internet infrastructure, and tech-based entrepreneurial resources could have a positive influence on entrepreneur behaviour, even if, in the present model, it is not that important.

Curiously, Entrepreneurial Education (EnEducation) had a negative total effect of -0.012 and a performance score of 48.843. So, it seems the current education systems when it comes to entrepreneurship may be somewhat far removed from entrepreneurs' real needs, at least according to this study. Reforms are urgently needed according to negative effect that involves incorporation of experiential learning, mentorship and real-world case discussion in the educational curriculum to make entrepreneurial Education more meaningful and aligned to practical entrepreneurial demand. Based on these results, there are areas of improvement as well as focus for the entrepreneurial ecosystem

7.10.3. Actionable Insights

The way of improvement for lower entrepreneurship and motivation has the highest path. It should be placed to improve Sustainable Entrepreneurial Intention by introducing, motivational training, workshops and resources for future entrepreneurs. The solution of Entrepreneurial Education is to reform entrepreneurial education most importantly to develop a curriculum that meets the needs of entrepreneurs. Also, there must be a collaboration between business and education. We need to work on other things too, like making the business and the economic environment better. Also making technology help better in a place like Pakistan is important as these two have a huge hindering impact. Additionally, leveraging the strengths of high-performing constructs, such as Entrepreneurial Subjective Norms and Attitude, can further promote entrepreneurial behavior by reinforcing supportive social norms and cultivating a positive entrepreneurial culture. These strategies collectively aim to address systemic challenges and optimize the entrepreneurial ecosystem for sustainable outcomes.

Table 7.11: IPMA Results for Sustainable Entrepreneurial Behavior (DV)

Construct	Total Effect (Importance)	Performance
EnEducation	-0.012	48.843
EntSNorm	0.355	74.47
Ent_Att	0.144	73.821
PBarrier	0.097	71.657

Construct	Total Effect (Importance)	Performance
SEintention	0.445	71.888
SFBizEnv	0.123	50.436
SFEconEnv	0.112	55.774
SFTekSupport	0.072	46.408
Self_Efy	0.06	73.062
SituFactors	0.23	51.482

7.10.4. Strategic Insights for Management:

Based on the IPMA results, management should prioritize enhancing Sustainable Entrepreneurial Intention, and Situational Factors (economic, business, and technological environments), as these constructs have the most significant potential to improve entrepreneurial behavior. While entrepreneurial subjective norms and entrepreneurial Attitudes already show high performance, maintaining or slightly improving them will further strengthen the model's outcomes. Moreover, efforts should be made to reassess the role of Entrepreneurial Education, as its negative effect suggests that the current educational approach may not be effective in fostering sustainable entrepreneurial behavior. In a nutshell, IPMA provides valuable insights into where management should focus resources and strategies to maximize the effectiveness of interventions promoting sustainable entrepreneurial behavior.

FINDINGS AND CONCLUSION

8.1. Summary of Key Findings

The data analysis collected from university business school students in Türkiye and Pakistan yielded significant insights into the factors shaping Sustainable Entrepreneurial Behavior in these distinct socio-economic and cultural contexts. The research utilized Partial Least Squares Structural Equation Modeling (PLS-SEM) to analyze the relationships between Entrepreneurial Attitude, Self-Efficacy, Entrepreneurial Subjective Norms and Perceived Barriers and the mediating influence of Sustainable Entrepreneurial Intention while also examining the moderating effects of Situational Factors and Entrepreneurial Education.

Results showed that Sustainable Entrepreneurial Intention is the chief predictor of Sustainable Entrepreneurial Behavior with a large total effect in Türkiye and Pakistan. Nonetheless, this correlation is stronger for Turkish students because they are more entrepreneurially conditioned with favorable external conditions in place. To elaborate, Türkiye's entrepreneurial ecosystem is more supportive, with resource provisions and enhanced educational structures. Without any doubt entrepreneur networks in Türkiye and St. Petersburg are more homogeneous than don't network entrepreneur support group formation. On the other hand, Pakistani students had a similar amount of self-efficacy but had a weaker systematic barrier and subjective norm to this behavior.

In both Türkiye and the USA, Entrepreneurial Attitude greatly impacted Sustainable Entrepreneurial Intention although, the impact in Türkiye was greater. Türkiye's stronger entrepreneurial infrastructure and innovation-oriented culture as reported in GEM (Global Entrepreneurship Monitor) reports are consistent with this discovery. On the other hand, Pakistani students had a higher level of Perceived Barriers. In other words, the economic, institutional, and cultural barriers impede the entrepreneurial intention and behavior of Pakistani students. Pakistan must undergo structural reforms due to an underdeveloped entrepreneurial ecosystem and hurdles to business investment.

In both countries, one other area of concern was situational factors which included the business and economic environment and the technology support. However, it was much more of a problem in Pakistan than in India. The much lower performance

scores of these parameters reveal the lower infrastructure, policy support and technology of these nations. Making things better in these areas could help entrepreneurs, especially in Pakistan, do better work.

Interestingly, Entrepreneurial Education had a negative total effect on Sustainable Entrepreneurial Behavior in both countries, indicating a gap between textbook knowledge and the real-life experience of entrepreneurs. Considering the findings, colleges must revise their syllabuses and offer plenty of experience, mentorship, internships and more. Whether it was a problem in both cases, with more impact in Pakistan. Where the education system is generally not aligned with entrepreneurship.

In summary, the comparative analysis shows important contextual differences and common challenges. Türkiye's stronger entrepreneurial attitudes and subjective norms show that culture and policy are important for entrepreneurship. Pakistan's higher perceived barriers and weaker situational factors call for a system-wide reform at the same time. Helping with these factors will help stakeholders of both countries nurture Sustainable Entrepreneurial Behavior and bridge that gap between thought and action. It will help to achieve long-term economic development.

8.2. Consolidated Hypothesis Report

H#	Hypothesis	Decision
H1	Entrepreneurial attitude directly affects Sustainable Entrepreneurial Behavior.	Accepted
H2	Self-efficacy has a direct effect on sustainable entrepreneurial behavior..	Accepted
H3	Entrepreneurial Subject Norms directly impacts Sustainable Entrepreneurial Behavior.	Accepted
H4	Perceived barriers directly affect sustainable entrepreneurial behavior within the community.	Accepted
H5	The intention of Sustainable Entrepreneurial has a direct impact on Sustainable Entrepreneurial Behavior.	Accepted
H6	There is a direct effect of Entrepreneurial Attitude on Sustainable Entrepreneurial Intention.	Accepted

H#	Hypothesis	Decision
H7	Self-efficacy has a direct effect on sustainable entrepreneurial intention.	Accepted
H8	There is a direct effect of Entrepreneurial Subject Norms on Sustainable Entrepreneurial Intention.	Accepted
H9	There is a direct effect of Perceived Barriers on Sustainable Entrepreneurial Intention.	Accepted
H10	Entrepreneurial Education has a direct effect on sustainable entrepreneurial behavior.	Rejected
H11	Situational factors have a direct effect on sustainable entrepreneurial behavior.	Accepted
H12A	Sustainable Entrepreneurial Intention mediates the relationship between Entrepreneurial Attitude and Sustainable Entrepreneurial Behavior.	Accepted (Partial Mediation)
H12B	Sustainable Entrepreneurial Intention mediates the relationship between Self-Efficacy and Sustainable Entrepreneurial Behavior.	Accepted (Partial Mediation)
H12C	Sustainable Entrepreneurial Intention mediates the relationship between Entrepreneurial Subject Norms and Sustainable Entrepreneurial Behavior.	Accepted (Partial Mediation)
H12D	Sustainable Entrepreneurial Intention mediates the relationship between Perceived Barriers and Sustainable Entrepreneurial Behavior.	Accepted (Partial Mediation)
H13	Entrepreneurial Education moderates the relationship between Sustainable Entrepreneurial Intention and Sustainable Entrepreneurial Behavior.	Rejected
H14	Situational Factors moderate the relationship between Sustainable Entrepreneurial Intention and Sustainable Entrepreneurial Behavior.	Accepted

In this study, twelve hypotheses were tested, with ten hypotheses accepted and two rejected. The acceptance of ten hypotheses indicates significant relationships among the constructs while rejecting two hypotheses suggests no significant effect or moderation.

The key findings indicate that Sustainable Entrepreneurial Intention emerged as the strongest predictor of Sustainable Entrepreneurial Behavior, with a robust path coefficient ($\beta = 0.445$, $p < 0.001$). This result highlights the pivotal role of intention in motivating sustainable entrepreneurial actions among students. Additionally, Entrepreneurial Subjective Norms significantly positively affected Sustainable Entrepreneurial Intention ($\beta = 0.355$, $p < 0.001$), suggesting that social pressures or expectations positively influence students' intentions in both countries.

Moreover, Entrepreneurial Attitude ($\beta = 0.144$, $p < 0.01$) and Self-Efficacy ($\beta = 0.06$, $p < 0.05$) positively contributed to Sustainable Entrepreneurial Behavior, though with smaller effect sizes compared to subjective norms and intentions. Notably, Entrepreneurial Education displayed a negative total effect on entrepreneurial behavior ($\beta = -0.012$), implying that existing educational frameworks in Türkiye and Pakistan may not adequately support the development of the entrepreneurial mindset and skills essential for sustainable entrepreneurship.

Furthermore, situational factors, including the economic environment, business environment, and technology support, significantly moderate the relationship between intention and behavior ($\beta = 0.23$), emphasizing the role of a supportive external environment in fostering positive entrepreneurial outcomes.

The rejection of these hypotheses, which propose a direct and moderating effect of Entrepreneurial Education on Sustainable Entrepreneurial Behavior, may reflect distinct educational challenges in Türkiye and Pakistan. In both perspectives, current educational systems may lack factors that effectively encourage entrepreneurial skills, analytical thinking, and a sustainable mindset.

8.3. Compare and Contrast with Past Studies

This study's findings agree and disagree with those in earlier studies in key areas. According to the results, the previous studies showed that Entrepreneurial Intention had an essential effect on forming behavior (Morales-Alonso et al., 2024). As per these studies, this study finds that intention is a strong mediator between personal characteristics (e.g., Attitude, self-efficacy) and behavior.

The previous literature suggests that Entrepreneurial Attitude and Subjective Norms are significant predictors of Sustainable Entrepreneurial Intention (SEI). For example, (Soomro et al. 2024) found that entrepreneurial Attitude enhances the entrepreneurial

intentions of students in Pakistan, consistent with this study's findings. (Özlem & Çelik ,2021) formulated a research that highlighted the role of social norms in incentivizing entrepreneurship in Türkiye. This is in synchrony with the findings showing that Subjective Norms have a strong influence on SEI and SEB in both nations. A study of Akfırat et al. (2023) cites social norms as crucial in societies that follow collectivism.

The significance of Self-Efficacy as a psychological driver in entrepreneurship has been documented in literature. (Saoula et al. ,2023) state that self-efficacy plays a universal role in motivating entrepreneurial intentions, thus similar to this study, self-efficacy influences SEI in Türkiye and Pakistan. Also, this study agrees with (Rasool et al. , 2022) since students of Pakistan face shocking issues such as economic instability and lack of mentorship for their entrepreneurial behaviors. In a similar vein, a recent report released by (Hill et al., 2023), Global Entrepreneurship Monitor, states that there are limited resources in almost all developing countries, which is in sync with show greater Perceived Barriers in Pakistan.

According to (Somia et al., 2024), the total effect of Entrepreneurial Education on SEB is negative. This goes against much of the literature which finds a positive relationship between Education and behavior of entrepreneurs. Educational program of Türkiye and Pakistan are not preparing students with sustainable entrepreneurship practically. It was found out that the overall theoretical focus of the educational framework is not practical for entrepreneurs. For instance, (Alkan, 2019) found that entrepreneurial Education positively affects the entrepreneurial intention in Türkiye, which is a contrast to this study's findings. Likewise, Türkiye's entrepreneurial ecosystem is sufficient in the thought and practice gap according to (KİRMİKİL, 2023). Nevertheless, the findings suggest that not integrating sustainability leads to inefficiency in the education system in promoting SEB.

In Pakistan, prior research including (Rasool et al. ,2022; Shah & Soomro, 2017) has insisted that systemic barriers pose significant barriers. The current research supports this, but it also shows how situational factors such as weak technological and economic environment greatly dilute self-efficacy's impact on SEB. Earlier works did not emphasize that as much, suggesting that we must consider other contextual factors as well.

8.3.1. Possible Explanations for Discrepancies

1. **Cultural Context**: The collectivist (cooperative) cultures of Türkiye and Pakistan focus on social norms. These norms have a significant impact on SEI and SEB. However, due to Türkiye's relatively advanced entrepreneurial ecosystem and Pakistan's bureaucratic inefficiencies, there are varying outcomes in entrepreneurial behavior.
2. **Educational Frameworks**: The negative effect of entrepreneurial education has to do with their outdated curricula which focuses more on theory than on experience. This gap between academia and real-world entrepreneurial requirements could be why Education does not enhance SEB, particularly Pakistan.
3. **Economic and Structural Differences**: The economic situation in Türkiye is more supportive, which contributes to better entrepreneurial outcomes, Özlem and Çelik (2021) note. On the other hand, Pakistan's economic instability and inadequate technology-related infrastructure heighten barriers, causing its SEB scores to be lower.

The results of this research provide an in-depth understanding of the factors affecting SEB in Türkiye and Pakistan. This will enable us to gain desirable insights into both countries' entrepreneurial ecosystems. Türkiye's entrepreneurs are more mature than Pakistan's. This is because the subjective norms are stronger in Türkiye than in Pakistan. The situational factors are also more favorable in Türkiye than they are in Pakistan. However, it is not systemic. Rather, the barriers are perceived to be higher in Pakistan. The situational factors are also much weaker in Pakistan. A key finding found in both countries is that Entrepreneurial Education has a negative impact on SEB, highlighting the need for curricula reforms with industry.

Türkiye represents the necessity to build a supportive entrepreneurial eco-system at the policy level in a manner compatible to cultural, institutional and economic contexts. The results underscore the need for Pakistan to reform systems to lower barriers and strengthen situational factors. Improving technology resources, streamlining business processes, and improving access to funds will help overcome existing limitations and unleash the entrepreneurial spirit of its students. With strategic

policy and education reforms, both countries will be able to increase their entrepreneurial talent for sustained economic growth.

8.4. Implications

8.4.1. Theoretical Implications

The findings from this study contribute to existing literature on entrepreneurial behavior in important ways. To begin with, the study presents evidence confirming the role of Sustainable Entrepreneurial Intention as a critical mediator in the relationship among personal factors, environmental factors, and entrepreneurial behavior. As per the theory of planned behavior, intention is the most important predictor of behavior (Fishbein & Ajzen, 1974) .

Second, impact is Entrepreneurial Subjective Norms, which indicates that social influence theory plays a substantial role in molding Entrepreneurial Intention in these two selected countries that are recognized for their collectivist cultures, Türkiye and Pakistan. Building on these findings extends the generalizability of social influence theory to the case of sustainable developing country entrepreneurship.

Third, the findings of the study create an assumption that Entrepreneurial Education will develop entrepreneurial behavior. The negative effect of Education. Current schools don’t appear to be preparing students to meet the implementation gap. Educational practice could use a little more robotics and a little less theory. It’s time to check your curriculum.

In the end, the contribution of Situational Factors to the moderating effect of intention–behavior relationship adds to the increasing literature on the role of the external environments in entrepreneurship. This highlights how personal beliefs or intentions interact with external beliefs. As a result, it enhances knowledge of context-entrepreneur behavior.

8.4.2. Practical Implications

The results of the study have implications for educational professionals, policymakers, and university administrators.

Essentially, the first role of Sustainable Entrepreneurial Intention universities must focus on enhancing entrepreneurial intentions by focusing on experiential learning, mentorship, and real-time projects. Motivating pupils to formulate actionable

entrepreneurial aspirations can enhance entrepreneurial behavior sustainability. The negative impact of Entrepreneurial Education highlights a divide between theoretical learning and actual entrepreneurial competencies. The curricula of Pakistani and Turkish Universities need to incorporate more hands-on training, internships, and collaboration with industry professionals. Teaching innovators and educators the values of sustainability to facilitate short-term cultural modification can assist long-term sustainable development goals.

Third, situational factors call for external surroundings that support you. Both countries' policymakers should improve the business environment, economic conditions and access to technology for aspiring entrepreneurs. Ensuring that entrepreneurs have access to the resources, economic environment, and technology infrastructure allows them to convert their intentions into sustainable actions.

8.5. Comparative Findings Analysis of Türkiye and Pakistan

8.5.1. Türkiye: Bridging the Theory-Practice Gap in Entrepreneurship Education

In Türkiye, many people are employing entrepreneurship education into their higher education institutions; however, a focus on theory is largely seen as limiting application. The Turkish education system has launched several initiatives to spur entrepreneurship. However, the programs mainly focus on classical theories of business and lack experiential learning. Moreover, they are seldom based on sustainability aspects or mentor-oriented practices. This gap is evident in the study findings. Turkish students have shown rather strong entrepreneurial attitudes (mean HTMT 0.466) and subjective norms but can't make full use of educational experience connections to sustainable entrepreneurial goal.

Türkiye's more developed entrepreneurial ecosystem reduces the impact of these limitations. Thanks to government initiatives, mentorship networks, and financing opportunities that favor startups, Entrepreneurial Intentions are being translated more often into Actions. However, the absence of stress on sustainability principles will endanger the long-run impact of entrepreneurial ventures to solve environmental and social challenges. Balancing sustainability with hands-on learning and mentoring in Türkiye may further align entrepreneurship education with sustainable entrepreneurial outcomes.

8.5.2. Pakistan: Overcoming Systemic Barriers in Entrepreneurship

The entrepreneurs of Pakistan face the challenges that hinder the entrepreneurs' Education from converting into actions. Higher education in Pakistan is still mostly focused on rote and theoretical learning. Most professors do not guide students towards experiential learning opportunities such as internships, case studies, or projects. The problem is chronic, that is reflected by the score of Sustainable Entrepreneurial Behavior which is lower than Türkiye and higher Perceived Barrier (e.g. economic instability, weak technology infrastructure). The educational establishments, syllabi, and educational qualification of teachers adopted by Pakistan don't align with its entrepreneurship development aims. As such the misalignment deepens the gap between education and entrepreneurship. Thus, the finding is that Entrepreneurial Education in Pakistan possesses a higher total negative effect on Sustainable Entrepreneurial Behavior than other countries.

Likewise, socio-economic factors due to traditional career choices and bureaucratic glitches discourage students from becoming entrepreneurs. Pakistani reduce self-efficacy due to structural obstacles faced by entrepreneurs. And as a result, it cannot be manifested in entrepreneurial intentions, in comparison with Turkish students. To solve these problems needs major reform such as the inclusion of sustainability concepts in their curricula, collaboration with industry partners, and structured experiential learning.

8.5.3. Psychological and Contextual Drivers

This study's findings significant insights into the psychological and contextual factors that influence entrepreneurship in Türkiye and Pakistan. The two countries share similar findings regarding the Entrepreneurial Attitude and Subjective Norms as the predictors of Sustainable Entrepreneurial Behavior. Yet, differences are noticeable in the shaping of outcomes in entrepreneurship by systemic factors.

Türkiye: Higher performance of entrepreneurial constructs indicates a relatively strong ecosystem. Students are better prepared for entrepreneurship in India due to supportive socio-economic policies, cultural emphasis on entrepreneurship and strong mentorship programs. Relying too much on theory creates a disconnect, which limits outcomes for sustainability in the long-term.

Pakistan: Students face challenges due to the perception of high barriers and weak situational factors such as limited economic and business support. Problems like these reduce performance on the various constructs, ultimately leading to a weaker impact of entrepreneurial Education.

8.6. Recommendations: Policy and Educational Reforms

1. **Curriculum Redesign**: Entrepreneurship education in both countries needs to modify to provide more experience-based learning such as project-based courses, internships, and sustainability modules. Because Türkiye's ecosystem is stronger, it can focus on embedding sustainability values. Pakistan, on the other hand, should first focus on foundational reforms to lessen reliance on rote learning.
2. **Reducing Perceived Barriers**: Barriers to business in Pakistan include inefficiencies in the bureaucratic process, weak access to finance, poor technology infrastructure and deficient human capital. We should also focus on making the business registration process easier and setting up more innovation hubs at universities.
3. **Industry Collaboration and Mentorship**: If both nations set up structured mentorship programs and collaborate with industry stakeholders, Education can help bridge the gap with practice. Türkiye may scale existing initiatives with a focus on sustainability while Pakistan may develop mentorship networks from the ground up.
4. **Policy Support**: Türkiye's government-supported successful programs help foster entrepreneurship, providing an opportunity for the same in Pakistan. To make a supportive environment with institution, culture, economy for sustainable entrepreneurship, policy interventions should be aligned.

8.7. Conclusion

This chapter presents a thorough examination of Sustainable Entrepreneurial Behavior (SEB) in Türkiye and Pakistan. It offers valuable theoretical insights into the psychological, cultural, and systemic forces that affect entrepreneurship. This study indicated that entrepreneurial Attitude, subjective norms, and self-efficacy are vital drivers of SEI and SEB and is in consonance with a large segment of the existing literature. But, the unfavorable impact of Entrepreneurial Education and the

contrasting situational and economic factors in both countries suggest interventions in areas of priority.

Türkiye's relatively developed business ecosystem has great entrepreneurial attitudes and development situational and systemized relational factors which possible in the entrepreneurial ecosystem of SEB. It limits the impact of the education system when principles of sustainability are not integrated. On the contrary, in Pakistan, the misalignment between systemic challenges and psychological drivers is more significant. That is, the perceived barriers are higher. Also, the economic and technological environments are weaker. This significantly reduces the impact of these psychological drivers like Self-Efficacy.

Results of the research suggest curriculum overhaul, policy change and better industry coordination in both countries. Türkiye should add modules for sustainability, experiential learning. Pakistan should implement systemic reforms to lower barriers to entry and build its entrepreneurial infrastructure. If these gaps are bridged then both nations can unleash the benefits of entrepreneurship to foster sustainable economic growth and innovation in their region. This paper is comparative and will help in academic learning. Alongside this, the paper will help policymakers and intelligentsia in promoting sustainable entrepreneurs in various socio-economic situations.

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APPANDIX A (QUESTIONNAIRE)

Questionnaire:

Dear Participant,

This study focuses more on "Sustainable Entrepreneurship," which refers to creating and managing a business that balances economic, environmental, and social value creation. This study aims to examine the factors that affect university students' sustainable entrepreneurship behavioral intentions intention. As a student, you are invited to share your opinion about variables under investigation. A questionnaire is designed into different sections to enable you to provide such helpful information. This questionnaire will take fifteen minutes of your valuable time. To ensure that all data remains confidential, please avoid including your name. Since participation in this research is on a volunteer basis, if you choose to participate, please answer all questions and return the filled questionnaire to the researcher. Thank you for your time.

Sincerely,

Muhammad Hassan Abbas

PhD. Candidate at Istanbul Sabahatin Zaim University, Istanbul Türkiye

Section (A):

This part concerns some general information. Please tick (√) in provided box bellow that best describes your answer.

1. Gender: Male ☐ Fem☐

2. Age: 18-24 ☐ 2☐34 3☐44 45 ☐ or above

3. Year of study: 1th year ☐ 2th year☐ 3th year ☐ 4th year o☐bove

4. Education level: Undergraduate ☐ Master ☐ PhD ☐

5. Status of the University Public ☐ Private ☐

6. Marital Status: Single ☐ Married ☐

Attitudes strongly disagree ← → strongly agree					
1. Being a sustainable entrepreneur implies more advantages than disadvantages to me.	1	2	3	4	5
2. A career as a sustainable entrepreneur is attractive for me.	1	2	3	4	5
3. If I had the opportunity and resources, I'd like to start a business.	1	2	3	4	5
4. Being a sustainable entrepreneur would entail great satisfactions for me.	1	2	3	4	5
5. Among various options, I would rather be a sustainable entrepreneur.	1	2	3	4	5
Subject Norms					
6. If I decide to create a sustainable venture my family will support, my decision	1	2	3	4	5
7. My close friends will support me if I want to establish a sustainable enterprise.	1	2	3	4	5
8. If I plan to set a sustainable venture, my teachers will praise that decision.	1	2	3	4	5

Self Efficacy					
9. I believe I am capable to identify new business opportunities for sustainable change	1	2	3	4	5
10. I have potential to create new products/services to solve sustainable problems	1	2	3	4	5
11. I always think creatively to benefit others.	1	2	3	4	5
Opportunities					
12. I always keep an eye out for sustainable venture ideas when looking for information	1	2	3	4	5
13. When facing multiple opportunities, I can select the good ones.	1	2	3	4	5
14. Nothing is more interesting than seeing my ideas turn into reality.	1	2	3	4	5
Economic environment					
15. I believe that the economic environ ment of my country supports entrepreneurial activities	1	2	3	4	5
16. I believe that the economic policies of my county support entrepreneurial activities.	1	2	3	4	5
17. The country's economy offers a vari ety of oppertunities for entrepreneu rs.	1	2	3	4	5
18. Being an entrepreneur, I can get financing from banks easily.	1	2	3	4	5
Educational system					
19. I feel that university education promotes entrepreneurial behaviours.	1	2	3	4	5

20. I feel that university education encourages entrepreneurial intentions.	1	2	3	4	5
21. My university education inspires me to build innovative concepts.	1	2	3	4	5
22. The university develops my entrepreneurial skills and capacities.	1	2	3	4	5
Sustainable Entrepreneurial Intention					
23. I am determined to create a sustainable entrepreneurial venture in the future.	1	2	3	4	5
24. I have a strong intention to start a sustainable venture in the future.	1	2	3	4	5
25. My professional goal is to be a sustainable entrepreneur.	1	2	3	4	5
26. I have very seriously thought of starting a sustainable venture in the future.	1	2	3	4	5
27. I will make every effort to start and run my own sustainable venture.	1	2	3	4	5
28. My qualification has contributed positively towards my interest in starting a sustainable venture.	1	2	3	4	5
Technological Perspective					
29. Using technology will enhance my effectiveness.	1	2	3	4	5
30. Technology usage will improve my performance as a sustainable entrepreneur.	1	2	3	4	5
31. I believe in future; the technology will be useful in sustainable entrepreneurial activities.	1	2	3	4	5
32. I feel it is a strategic necessity to use technology to compete in the marketplace	1	2	3	4	5

33. I believe I will lose opportunities to my competitors if I do not adopt technology in me entrepreneurial activities	1	2	3	4	5
34. Technology generated in me a greater appreciation of the figure of the sustainable entrepreneur	1	2	3	4	5
35. Technology generated a preference in me for the opportunities offered by being a sustainable entrepreneur	1	2	3	4	5
36. Technology can develop the skills needed to be a sustainable entrepreneur	1	2	3	4	5
37. Technology helped develop the intention to become a sustainable entrepreneur.	1	2	3	4	5
Business environment					
38. My country's business environment is good and suitable for beginning an enterprise.	1	2	3	4	5
39. My country's business environment is largely risk-free, making it possible to establish a business.	1	2	3	4	5
40. In the last five years, the business environment in my country has improved significantly.	1	2	3	4	5
Perceived Barriers					
41. My involvement in the sustainable entrepreneurship is hindered by customized training programme for students based on their needs	1	2	3	4	5
42. My involvement in the sustainable entrepreneurial activities is hindered by the reasonable training program cost and its proximity.	1	2	3	4	5
43. My involvement in sustainable entrepreneurship is negatively influenced by training program based	1	2	3	4	5

on essential business management skills					
44. Training program on business failure and its sign and causes will help in taking correct decision on time	1	2	3	4	5
45. My viability with potential will increase, if I receive training program enabling me to use sustainable media to promote my business	1	2	3	4	5
46. Lack of initial capital prevents my sustainable entrepreneurial activities	1	2	3	4	5
47. I avoid establishing sustainable enterprise due to the current economic situation.	1	2	3	4	5
48. Fiscal charges (taxes, legal fees, etc.) hinders sustainable entrepreneurial activities	1	2	3	4	5
49. I cannot afford the start-up costs of a sustainable venture because of the lack of assets.	1	2	3	4	5
50. It is difficult to obtain finances to start-up a sustainable venture	1	2	3	4	5
51. There is awareness in the university about the importance of sustainable entrepreneurship	1	2	3	4	5
52. There is a need to create awareness about sustainable entrepreneurship in the university students.	1	2	3	4	5
53. I don't have ideas regarding how sustainable venture to start.	1	2	3	4	5
54. I feel I am hindered by lack of entrepreneurial competence.	1	2	3	4	5
55. Lack of experience of the business world and market limits me	1	2	3	4	5
56. Lack of experience in management and accounting is one of my concerns	1	2	3	4	5
57. I doubt about my personal abilities	1	2	3	4	5

58. I suffer from lack of available assistance in assessing business viability.	1	2	3	4	5
59. Lack of legal assistance or counselling is a key issue.	1	2	3	4	5
60. Lack of formal help to start a sustainable enterprise prevents me from pursuing my goals	1	2	3	4	5
61. There is a lack of organizations to assist sustainable entrepreneurs.	1	2	3	4	5

Please indicate your level of agreement regarding the separate statements from 1= strongly disagree,2= disagree, 3 = Neutral, 4 Agree, 5 = strongly agree