



Understanding the Factors Affecting Women Entrepreneurial Ventures Success: A Study of Female Incubates Working in the IT Industry of Pakistan

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Abstract

The participation of women in entrepreneurial activities, especially within the IT sector, is increasingly important for Pakistan's socioeconomic scene. This research study has explored and therefore examined factors affecting success among female entrepreneurs in the IT industry with a specific focus on female incubates who have completed training programs. An extensive literature review combined with qualitative research methodology has been used to bridge this gap by examining post-incubation challenges facing women entrepreneurs and suggested strategies for improving sustainability of their businesses. In order to get rich and nuanced data from female incubates in the IT field, the research design employs qualitative approach with the use of in-depth interviews and document analysis. The prevailing research study gives us a fresh perspective on how socio-cultural, economic, institutional and personal forces affect women's entrepreneurship. The data was analyzed by using thematic and constant comparative methods to identify similarities between patterns so as to uncover complex dynamics inherent in women entrepreneurship operating within information technology industry in Pakistan. At every step of the research process, ethical considerations such as informed consent and confidentiality was strictly adhered to. Also, the contemporary research study makes recommendations for policy implementation, education schemes, as well as economic assistance meant for assisting women entrepreneurs in Pakistan. This research study aims to improve our understanding of factors that affect women's entrepreneurial success and set up a way for viable businesses in Pakistan's IT industry.

Keywords: Women Entrepreneurship, Incubation Centres, IT Industry, Pakistan

1. Introduction

Both in developing countries and developed nations, small enterprises account for major influence on economic growth, creative thinking support, and job opportunities (Heyden et al., 2017; Baskaran et al., 2019). The Pakistani economy heavily depends on small businesses whose contribution to the GDP is huge and thus act as drivers for development (Zafar & Mustafa, 2017). However, there is a great concern about the viability of these institutions especially those run by women within IT areas (Mashapure et al., 2022).

As a result, in the recent years' women entrepreneurship has become more and more important as contributors to economic empowerment, gender equality and socioeconomic development (Henry et al., 2016). In addition to this, economies benefit from it through job creation and new industries (Kelley et al., 2010) while the entrepreneurial diversity growing in different contexts for economic inclusive growth (Chen et al., 2023). Women entrepreneurs do face peculiar difficulties unique to them within the field of entrepreneurship generally (Cabrera & Mauricio, 2017). For instance, women entrepreneurs in IT industry face unique challenges such as limited access to resources, gender biases and few executive positions held by women (Herrmann & Nadkarni, 2014).

Despite the significant contribution that women in business bring to their respective country's gross domestic product (GDP), little attention has been paid towards them in most emerging economies (Kelley et al., 2010) and poverty reduction (Khan, 2014). This is due to complicated socio-cultural factors as well as religious and family structures interacting with each other (Roomi, 2013). In Pakistan's context the discussion is more on how women fit into the traditional patriarchal society of Pakistan, for instance.

However, women-led IT ventures have proved themselves to be resilient and innovative despite all these challenges, thus leading to technological advancements and noticeable economic growth (Heyden et al., 2017). In addition, many studies have revealed that considerable involvement in the entrepreneurship growth across different industries by Pakistani women is made but they face numerous factors and obstacles preventing them from being successful businesswomen and strong contributors of gender equality (Torres-Ortega et al., 2015). Furthermore, there is a scarcity of literature on women entrepreneurs within the IT sector in Pakistan (Yunis et al., 2018), warranting further inquiry into this area so as to comprehend its unique dynamics and develop approaches for empowering female entrepreneurs.

In the context of Pakistan's dynamic entrepreneurial landscape, women-led ventures in the Information Technology (IT) sector face a multitude of challenges that impact their sustainability. These challenges are further compounded by the unique socio-cultural context of Pakistan, which presents both opportunities and obstacles for women entrepreneurs. Previous studies have examined the importance of factors such as family support, self-confidence (Twibell et al., 2008), and motivation (Azmi, 2017), willingness to take risks and motivation (Abd

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Rani and Hashim, 2015), and lack of entrepreneurial skills (Muhammad et al., 2017) in the study of female employees. Although laws, customs, access to finance, and government policies (Muhammad et al., 2017) strongly influence the performance of women-owned businesses. Moreover, the most significant obstacles for women entrepreneurs in Islamic nations are social and cultural norms on the one hand and family issues on the other (Poggesi et al., 2016).

Women's access to resources, networks, and opportunities are often restricted within the IT industry by cultural norms and gender biases (Ghaderi et al., 2023). In addition, the IT industry in Pakistan has been marred with regulatory hindrances, underdeveloped infrastructure, and market dynamics that disproportionately affect businesses owned by females (Khan et al., 2021). On this premise, appreciating the troubles of women entrepreneurs in sustaining their IT startups in Pakistan is vital for creating an enabling ecosystem that facilitates their growth and prosperity. Some studies earlier have looked at these factors primarily focusing on developed countries where female entrepreneurs operate under different supportive legislation and regulations governing establishment or operation of own firms (Abd Rani & Hashim, 2015; Hasan & Almubarak, 2016).

Consequently, Roomi et al. (2018) contend that a complex interplay of sociocultural factors influences women's entrepreneurial career decisions in both a determining and shaping manner. In addition, sociocultural elements affect the level of entrepreneurship at a given time and location (Khan et al., 2021). The performance and success of women-owned businesses are significantly influenced by social relationships, according to Arasti et al. (2012). It enables the business visionary to more clearly differentiate between opportunities and resources. Social networks have an impact on entrepreneurs' efforts to start businesses because they provide them with a model for success and help them gain support (Mehtap et al., 2017).

It is however, disappointing to note that research on women-led IT ventures within the IT sector in Pakistan has been sparse despite growing interest in entrepreneurship studies (Ali et al., 2023). Although there have been studies on entrepreneurship generally pointing out various factors influencing success and sustainability of such ventures, there is a gap in literature as far as women entrepreneurs' challenges in IT business are concerned. The past research papers done by different authors regarding Information Technology businesses tend to only focus on the experiences and perspectives of men leaving out those of women. Again, gender-specific dynamics are not appropriately explored in existing studies about the Information Technology industry thereby failing to capture the experiences and views of female entrepreneurs.

1.1. Contextual analysis

The Global Entrepreneurship Monitor (GEM) report emphasizes Pakistan's status as a "factors-driven" economy, having a low early-stage Total Entrepreneurial Activity (TEA) rate of 9.07 percent, which places it at the bottom of the global ranking (Qureshi et al., 2011). This is backed up by the male-female imbalance in early-stage entrepreneurship with Pakistani females recording one of the lowest TEA rates of 1.73 compared to men's 15.94 (Qureshi et al., 2011). But amidst such hurdles, moonshots like Pakistani government-backed Women's Business Development Center (WBDC) launched in 2012 look quite promising for women entrepreneurs as they take off and deal with industry entry complications (Asgary et al., 2012). Moreover, the formation of Women Bank Ltd is another manifestation that efforts are being made towards enabling women have access to business loans since this acknowledges that financial support is very vital in nurturing entrepreneurial activities in the society (Khan et al., 2021). Moreover, in various parts of Pakistan including populous cities such as Karachi and Lahore among others WBDCs were established to remove this bottleneck of credit thus there was no free flow of female entrepreneurs into business world (SMEDA, 2012).

The main problem of Pakistani women as emphasized by Rehman and Azam Roomi (2012) is to balance between family and work commitments which is aggravated by a combination of cultural elements and religious dogmas specific to this country. In the context of Pakistan being an Islamic state, in which cultural customs and religious directives play a major role in shaping the roles and responsibilities of women, the interaction between work and family life gains even more importance (Khan, 2014). However, previous studies have shown that this phenomenon has been underlined as one of important barriers that prevent women from participating in business activities and realizing entrepreneurial intentions mainly due to the effects of Islamic culture norms and religious rules connected with entrepreneurship (Modarresi et al., 2016). For instance, similar research done in other developing Muslim countries like Iran points out that females are affected by cultural constraints as well as gender-based inequalities hence increasing complexity within this framework concerning women entrepreneurs in Islamic society.

They further added that some factors like gender stereotypes, limited time and family-associated responsibilities have a direct effect on the success of women entrepreneurs in Pakistan. In line with this, Roomi et al. (2018) also point out that the lack of equal opportunities is one major factor that hinders women from using all their resources well. In addition, Modarresi et al. (2016) posit that personal desires for success as well as self-assurance and cultural activities are main drivers for female business owners which can be used to address the fundamental causes of system bias (Rieger, 2012; Balogun et al., 2017). Furthermore, Rey-Martí et al. (2015) and Tur-Porcar et al. (2017) state clearly how there are certain differences between women-owned businesses and mixed-gender-

owned firms in terms of roles played by each party involved and regulation thereby indicating that research into entrepreneurship should take gender specificities into account instead of generalizations.

1.2. Problem Statement

Although the presence of women entrepreneurs in Pakistan is increasing, there are still significant gaps between the performance of male and female entrepreneurs, suggesting that it is important to examine certain factors affecting business success in developing countries more deeply (Khan et al., 2021). To bridge this gap requires a thorough understanding of the distinctive challenges and opportunities faced by female businesspersons in terms of cultural, societal, and economic hindrances to their entrepreneurial pursuits (Roomi et al., 2018). It is therefore crucial to identify these complex factors that affect the business performance of female entrepreneurs as basis for targeted policy interventions, organizational initiatives and support programs aimed at enhancing their success (Tuncdogan et al., 2017; Noor et al., 2021). Therefore, by unraveling complexities surrounding women's entrepreneurship in Pakistan it would be possible for stakeholders to develop effective strategies that will empower them and enable them overcome hurdles hence become successful ventures.

Emergence of female business owners is increasingly recognized as a critical catalyst for driving socio-economic development in countries all over the world (Nasir et al., 2019). However, within Pakistan's IT sector, which has insufficient research and data, understanding the factors that influence sustainability of female-led entrepreneurial ventures continues to be a significant challenge (Fatima, 2017). This calls for an investigation into the determinants that contribute to the continuity of female entrepreneurship in IT in Pakistan (Allison et al., 2023). Further still there is an immediate need to examine the post-incubation trajectory of these women after their incubation programs are over since little is known about what happens in this regard (Zaidi et al., 2023). Addressing these gaps in understanding is crucial for informing policy initiatives, organizational strategies and support programs aimed at fostering the long-term sustainability and success of female entrepreneurs within Pakistan's dynamic IT industry.

Entrepreneurship has become more important for women globally, as they are actively involved in various entrepreneurial activities to full potential (Andriamahery & Qamruzzaman, 2022). Pakistan is among the countries where women have been participating in labor force and economic growth through various enterprises in the country such as SMEs, social work projects, NGOs etc. (Hussain et al., 2019). This percentage is almost twice as high as that of women's employment in Pakistan's labor force as it stands at only 20 percent despite accounting for around 38.8% of global workforce (UNDP, 2021). The gap needs to be closed with reference to this country by identifying obstacles facing female entrepreneurs in order to reach a level of participation close to the global average of about 40% females (UNDP, 2021). These constraints should be well understood and adequately addressed so that there can be gender balance while enabling women's entrepreneurship which will contribute greatly towards growing the economy of Pakistan.

1.3. Research Gap

Pakistan has been studied by numerous researchers specifically in the context of women entrepreneurs, but there is still a significant gap in research that focuses on experiences of women entrepreneurs who are incubated within IT field. The researches already done mainly concentrated on such areas as Non-Governmental Organizations (NGOs), social works, small and medium scale enterprises and also medium level businesses leaving out women's difficulties that are peculiar to working in IT. Studies have identified factors affecting firm performance such as employee behavior and economic conditions; however, little attention has focused on these factors especially regarding female entrepreneur's behaviors under IT industry (Modarresi et al., 2016; Khan, 2014).

Additionally, the SME industry has witnessed various studies on how risk-taking behavior correlates with firm performance. However, it is still a gap in the IT sector's literature (Khan et al., 2021). In the same vein, McClelland et al. (1976) have argued that women entrepreneurs' success is determined by their need for achievement. Fatima et al. (2017) argue that this approach lacks such research for women entrepreneurs in the IT sector. Furthermore, no empirical study has examined how poor government and financial support influenced women entrepreneurs in Pakistan as they ventured into IT firms which is important to be able to gauge what affects these ladies' investments (Plotnikov et al., 2019; Noor et al., 2021).

There is a clear recognition of the importance of family backing to firm performance, however, there are no studies that have explored this relationship among lady entrepreneurs in IT (Ramírez et al., 2021; Zeb & Ihsan, 2020). Although self-confidence has been found to be essential for success by female entrepreneurs in developed countries, very little research has focused on self-confidence and firm success among Pakistani female entrepreneurs in the IT sector (Martínez-Rodríguez et al., 2022; Yaqoob, 2020). Research on motivation is also limited among Pakistani women entrepreneurs in IT who are performing well but its absence might affect their future prospects (Zhao et al., 2021; Khan, 2020).

However, the impact of women entrepreneurs' poor business skills on firm performance needs to be further explored in relation to the lack of entrepreneurial abilities within IT industry (Ustyuzhina et al., 2019; Khan et al., 2021). The purpose of this research study is therefore to explore the challenges faced by women-led IT ventures in Pakistan with a view to determining their sustainability. Here, using existing literature and cross-referencing with global research will elucidate the unique hurdles that inhibit sustainable operations among IT-led female

firms in Pakistan (Mashapure et al., 2022). Thus, what this research study aims at achieving is through contrasting and comparing from relevant studies from information technology sector and taking a grounded approach to Pakistani socio-cultural landscape can lead us towards a more comprehensive understanding for where women entrepreneurs can locate opportunities and face challenges within the country's IT space.

1.4. Research Objective

- To understand the factors and challenges that are affecting the sustainability of female entrepreneurs, incubates who have received theoretical and practical training from incubation centers working across Pakistan and working in the domain of IT.

1.5. Research Questions

- What are the determinants of sustainability of firms owned by women in IT entrepreneurship especially given unique socio-cultural context and gender specific challenges?
- After leaving incubators what are some of the challenges that female incubates face within Pakistan's IT industry and how do these factors influence their entrepreneurial ventures' long-term viability?
- What can be done to reduce barriers, close these gaps, improve the situation with regard to female-run IT enterprises as well as engendering IT entrepreneurship in Pakistan?

2. Literature Review

Women entrepreneurship in Pakistan has become a recognized driving force of socioeconomic development and such recognition is gaining ground. In spite of numerous challenges, they encounter, women entrepreneurs are contributing much to the growth of their economy and society as a whole. A range of businesses led by women including startups that are innovative to small and medium-sized enterprises (SMEs) typify the entrepreneurial ecosystem in Pakistan, particularly within IT industry which is growing rapidly. Nevertheless, women in Pakistan face a number of obstacles, such as cultural norms, limited resources and gender inequality in the labor market that impinge on their attempts at starting new businesses. However, this does not stop women entrepreneurs from facilitating innovation (Heyden et al., 2017), creating jobs and empowering local communities for better living standards (Nasir et al., 2019; Fatima et al., 2017).

2.1. Women Entrepreneurship in Pakistan: Current Scenario

2.1.1. Data on Women's Participation in Entrepreneurship

In Pakistan, there has been a noticeable increase in women's participation in entrepreneurship, which reflects their growing role in the country's economic landscape (Roomi et al., 2018). Nevertheless, despite these advancements, differences still exist concerning female business activities and those of their counterparts. As per data from the Global Entrepreneurship Monitor (GEM), women are an important but under-represented segment within Pakistan's entrepreneurial ecosystem (Henry et al., 2017). For example, Nasir et al. (2019) discovered that though women constitute a significant proportion of the labor force, few participated in engagement with entrepreneurial activities inadequately. This shows that it is necessary to comprehend how female entrepreneurship can be encouraged through equitable practices at all levels leading to inclusive growth for disadvantaged groups.

2.1.2. Challenges Faced by Women Entrepreneurs in Pakistan

Pakistan's businesswomen face many social and cultural obstacles to their entrepreneurship. Nonetheless, traditional social norms and expectations about gender roles often prevent women from accessing resources, networks and entrepreneurial opportunities (Franzke et al., 2022). Besides, stereotypes in cultures and biases can undermine the confidence of women as well as discourage them from pushing forward with entrepreneurial activities (Twibell et al., 2008). In this regard, Roomi et al. (2018) emphasize that the existing cultural view on what defines a woman's role in society may hinder her dreams for a career in business hence maintaining the gender imbalance prevailing in this field.

Pakistan's women entrepreneurs face severe economic challenges which makes it difficult for them to have access to financial resources, capital and market opportunities (Nasir et al., 2019). The inability of women to start and grow their businesses due to limited credit and investment capital deepens the existing disparity in entrepreneurial outcomes (Hussain et al., 2015). At the same time, women owned enterprises are finding it hard to use formal financial services or obtain funding that they need for sustenance. To enable female entrepreneurship, thrive and be productive in the economy, Hussain et al. (2019) argue that these economic constraints have to be addressed. However, in Pakistan also, female entrepreneurs face legal and regulatory obstacles that impede their operations as well as business growth (Aslam et al., 2013). For instance, tricky rules and regulations, bureaucracy and court obstacles may cause severe impediments to women-owned businesses like startups or small enterprises (Jain & Kohli, 2024). Furthermore, the gender-based discrimination inherent in legal and regulatory practices only serves to compound these constraints faced by women entrepreneurs such that they are denied opportunities to trade on markets, obtain licenses as well as protect their intellectual property rights. In this regard, Mustafa et al. (2021) assert that policy reforms must be instituted to address these systemic barriers while providing institutional support with a view of creating an enabling environment for the thriving and success of women entrepreneurs.

2.2. Factors Influencing Women Entrepreneurship in Pakistan

2.2.1. Socio-Cultural Factors

In shaping women entrepreneurship in Pakistan, cultural norms and traditions have a huge role to play. Gender based beliefs that are held deep inside the culture of this society often hinder women from accessing resources, networks and business opportunities (Abd Rani & Hashim, 2017). Traditional gender roles dictate that family responsibilities should come first for women before anything else hence they may rather not venture in businesses (Modarresi et al., 2016). Moreover, stereotypes concerning societal expectations of women working might further perpetuate bias towards them and undermine their confidence in order to hinder their entrepreneurship dreams (Twibell et al., 2008; Dewi et al., 2016). This means that overcoming such cultural barriers demands challenging the status quo on gender issues as well as promoting an environment that is inclusive enough for female entrepreneurs (Rauch & Frese, 2007).

The women's entrepreneurial experiences in Pakistan are greatly influenced by gender roles and expectations (Rehman & Azam Roomi, 2012). The traditional roles of women as caregivers and homemakers often get in their way when they try to venture into entrepreneurship (Muhammad et al., 2021). Also, the requirements imposed on them by the society against their behaviors as well as leadership methods may come against the risk-taking and assertiveness usually linked to entrepreneurship (Rehman & Azam Roomi, 2012; Herrmann & Nadkarni, 2014). Overcoming these preconceived notions and gender stereotypes is fundamental in liberating female entrepreneurs so that they can exercise their willfulness.

2.2.2. Economic Factors

According to Afza and Amir Rashid (2009), women entrepreneurs often find limited resources of finance and capital as a great challenge in Pakistan. For instance, Wube (2010) points out that credit and investment capital are difficult for women owned businesses to obtain. The absence of financial resources denies the women the opportunity to increase their business size, innovate or expand into new markets (Heyden et al., 2017; Khan et al., 2021). Similarly, discriminatory lending procedures and gender biases prevalent in the financial sector have worsened the financing gap for female entrepreneurs around the globe (Saleem, 2012). Therefore, it is crucial to enhance access to cheap credit facilities, microfinance programs and risk capital for females while simultaneously offering them lessons on financial knowledge and leadership training.

Pakistan's women entrepreneurs' success is affected by market opportunities and industrial dynamics (Shakeel et al., 2020). In many instances, women businesspersons encounter stumbling blocks when it comes to accessing markets, identifying workable business ideas, and competing with their male counterparts in the industry (Fatima et al., 2017). Moreover, lack of access to networks and professional links by gender can curtail women's ability to grasp new market trends and developments in the sector (Yeoh & Hooy, 2020). Therefore, it is imperative for Pakistan to establish an inclusive entrepreneurial ecosystem that supports women's involvement and promotes gender equality among them so as to fully unleash their entrepreneurial potential.

2.2.3. Institutional Factors

In Pakistan, the presence of enabling policies and programs is vital for creating a conducive environment for women entrepreneurship. Government's entrepreneurship development schemes, incubation centers as well as gender-sensitive policies offer opportunity of interacting with trainers, mentors and building informal networks to female entrepreneurs (Zaidi et al., 2023). Gender-based interventions that address women economic empowerment constraints and remove obstacles to level the playing field are critical towards supporting women entrepreneurs (Manzoor et al., 2022). The role in supporting women entrepreneurs by both governmental and non-governmental organizations (NGOs) in Pakistan is vital (Ghani & Ghani, 2020). Government agencies can come up with policies and implement them so that there could be access to resources by women, enable faster business registration as well as deal with regulatory issues (Khan et al., 2016). On the other hand, NGOs provide support services at grassroots levels, training initiatives and also carry out lobbying campaigns targeted at addressing specific challenges faced by female entrepreneurs (Noor et al., 2021). Such an ecosystem needs collaboration among government institutions, NGOs, and other stakeholders if it wants to nurture successful women entrepreneurs.

2.2.4. Personal Factors

In Pakistan, women's entrepreneurship is heavily influenced by types of education and skills development. Invariably, these include quality education, vocational training, and entrepreneurship programs that give women knowledge and expertise necessary for success in running a business (Wiklund & Shepherd, 2005; Nasir et al., 2019). Also, there are needs to invest in educational provisions as well as skills development programs specifically targeting women entrepreneurs' interests. These will enable them to come up with ideas or adapt to changes accordingly so that they can continue being innovative and competitive entities in the market place (Jayeoba et al., 2013). Similarly, many articles have been published on the achievements of women in modern society but none has used such grand theory nor encompassed all of these internal and external factors among ascending economies (Lai et al., 2017). Hambrick & Mason (1984) assert during their Upper Echelon Theory about organization performance being influenced by top management's attributes and actions.

Women's entrepreneurial behavior and outcomes are critically influenced by motivation and self-efficacy (Colbert et al., 2014; Heyden et al., 2017). High levels of motivation, self-confidence, and resilience among women entrepreneurs better equip them to handle challenges, seize opportunities, and persist through difficult times (Khan, 2020; Chaudhary & Srivastava (2021). It is necessary to build entrepreneurial mindsets as well as foster a supportive environment that enhances the confidence and belief in self-amongst women for unlocking entrepreneurial potential and driving business performance (Twibell et al., 2008; Oney & Oksuzoglu-Guven, 2015).

2.3. Women Entrepreneurship in the IT Sector of Pakistan

2.3.1. Overview of the IT Industry in Pakistan

Pakistan's IT business has been growing and transforming quite remarkably over the last few years and it is emerging as a critical driver for economic growth and innovation (Shahzad et al., 2017). With an increasing pool of specialized workers, supportive administration regulations, and rising investments in digital infrastructure, IT sector in Pakistan provides an enabling environment for enterprise and technological innovation (Khan et al., 2021; Shair et al., 2022a). This industry includes such diverse activities like software development, e-commerce, IT services as well as digital marketing which significantly contribute to GDP of the country and generation of employment opportunities (Hamid & Khalid, 2016; Shair et al., 2023).

2.3.2. Participation of Women in the IT Sector

Pakistan's IT sector has been booming, but women still underrepresented in the industry, particularly in entrepreneurial positions and leadership. Gender disparities are still present in educational opportunities as well as provision of training and employment opportunities thus hindering women from participating and advancing their careers within the IT community (Fatima et al., 2017; Shair et al., 2024). Only a very few Pakistani women work in IT according to data provided by the Pakistan Software Export Board (PSEB), which underscores the need for gender diversity and inclusion interventions targeted at this sector (Nasir et al., 2019).

2.3.3. Challenges Specific to Women Entrepreneurs in the IT Industry

For women entrepreneurs in IT companies, there is difficulty in finding opportunities as well as resources they require for their business success (Khan & Ghufran, 2018). Male domination of IT industry tends to promote gender biases and stereotypes that lead to imbalances in funding availability or access to mentorship and networking among women entrepreneurs. In addition, procurement contracts for women are hard to access; government incentives may be lacking; venture capital providers may discriminate against them: all these factors discourage their initiation and growth of ICT firms (Afza & Amir Rashid, 2009).

Women entrepreneurs in the IT industry face additional challenges as far as cultural and societal perceptions are concerned, which affects their resource base, support systems, and entrepreneurial opportunities. Women acting within traditional gender roles and meeting society expectations generally discourage women from taking up careers in technological areas (Zhang & Cain, 2017; Deliana, 2023). These stereotypes propagate the belief that women have limited powers to do anything useful other than being just subordinates and such behavior is what prevents them from accessing various opportunities (Modarresi et al., 2016). Cultural factors like this create a lack of self-assurance among females who would otherwise become successful entrepreneurs in information technology if they overcome properly (Chaudhary & Srivastava (2021).

The technical skills and training given to these women are some of the determinants of their achievements. The problem however is that oftentimes women lack access to better education, job-oriented training or even skill building programs meant for them alone (Hussain et al., 2019). For example, female students experience limited chances of entering certain fields due to scanty teaching on STEM subjects. In order to address these issues, it is necessary to provide specific policies aimed at boosting ladies into STEM studies since such professions naturally demand coding boot camps and entrepreneurship trainings among others so as to encourage upcoming IT entrepreneurship successes (McClelland, 1988).

2.4. Incubation Centers and Women Entrepreneurship in Pakistan

2.4.1. Role of Incubation Centers in Supporting Women Entrepreneurs

These incubation centres are essential in aiding and abetting woman who engage in business through providing them with tools, advising and contacts necessary to start a venture (Safdar & Qamar, 2023). These hubs create an enabling environment that promotes inspiration, teamwork and sharing of ideas by the aspiring entrepreneurs especially the women (Asgary et al., 2012). Incubation centre's provision of working space, business development services and funding opportunities enable women to overcome obstacles in their attempt at becoming successful entrepreneurs in the competitive IT industry (McClelland, 1988; Shukla & Chauhan, 2018).

2.4.2. Impact of Incubation Programs on Women's Entrepreneurial Ventures

According to Khalid et al. (2021), the influence of the incubation programs persists on the accomplishment and perpetuation of women's startups in Pakistan. These programs prepare, train and support women through structured education courses, mentorship and coaching for them acquire requisite skills, knowledge, and confidence that will be useful in their entrepreneurial endeavors (Khan et al., 2021). Research demonstrates that ladies who undergo incubation are more likely to start successful businesses, generate more revenues and make jobs than those without such assistance (SMEDA, 2012). Furthermore, incubation programs enable access to

networks, markets as well as investment opportunities among others by which female entrepreneurs can scale up their ventures to achieve sustainability and profitability over time (Danso et al., 2016).

2.4.3. Post-Incubation Challenges and Opportunities for Women Entrepreneurs

Despite the advantages of incubation programs, a lot is yet to be done in supporting women entrepreneurs to maintain their businesses after getting out of incubation (Kering, 2019). Transitioning from the nurturing environment of an incubation hub into a competitive market scenario has special difficulties faced by women entrepreneurs (Kim et al., 2020), this includes; access to finance, market reach and recruitment and talent acquisition (Zaidi et al., 2023). Furthermore, cultural and social impediments like gender discrimination as well as family obligations may inhibit the full utilization of skills and resources gained during the period of voluntary confinement by women entrepreneurs (Noor et al., 2021). Conversely, post-incubation presents a window through which female businesspersons can use their new knowledge bases; abilities as well as connections to address these intricacies with an aim of seeing growth and expansion in their enterprises.

2.5. Strategies and Interventions to Support Women Entrepreneurs in Pakistan

2.5.1. Policy Recommendations

Pakistan's women entrepreneurs are faced with many systemic challenges and barriers that require effective policy interventions (Farooq et al., 2024). Policymakers must give priority to policies which are gender-responsive as well as initiatives aimed at promoting women's economic empowerment, access to resources and their participation in entrepreneurial ecosystems (Nasir et al., 2019). These measures would involve implementing regulations that facilitate women's access to markets, financial facilities, and government contracts through tax incentives and procurement policy (Khan et al., 2021). In addition, policymakers should give priority to the creation of business environment that is friendly for women. This includes provision of affordable childcare centers, flexible work arrangements and protection from gender based discriminative actions among others so as to enable involvement of more women in entrepreneurship (SMEDA, 2012).

2.5.2. Educational and Training Initiatives

In order to be successful in the rapidly changing and competitive business environment of Pakistan's IT industry, women entrepreneurs need education and training programs that can equip them with necessary skills and build their confidence (Chaudhary & Srivastava, 2021). There is a need for collaboration between non-profit organizations, educational institutions, and governmental agencies in developing entrepreneurship tailored specifically for women. Asgary et al. (2012) proposed that technical training, entrepreneurship education programs as well as capacity development initiatives should be jointly developed by government departments schools/colleges/universities and NGOs. The emphasis in these initiatives should be on entrepreneurial mindset, digital literacy, business acumen as well as technological capabilities of females that would enable them to exploit opportunities in the IT industry despite challenges they face (Hussain et al., 2019; Riasudeen et al., 2022). Additionally, both mentoring and coaching could go a long way in bridging this gap as they provide invaluable guidance support and networking avenues thereby enabling women entrepreneurs to navigate uncertainties related to business ownership while simultaneously boosting the pace at which their businesses are growing (Rehman & Azam Roomi, 2012; Shair et al., 2022b).

2.5.3. Access to Financial Resources and Mentorship Programs

For the growth and long-lastingness of Pakistani women entrepreneurs, it is important that they have access to funds and mentoring. The financial institutions, venture capitalists, and government agencies need to design projects promoting improved availability for women in terms of cheap credit, equity capitalization as well as venture capital (Noor et al., 2021). Within this framework, the IT sector can develop tailor-focused loan products, grants schemes and investment funds targeting female-owned enterprises (Zaidi et al., 2023). Additionally, mentorship programs are vital in guiding women entrepreneurs through experienced mentors or industry experts hence providing them with advice and support (Fatima et al., 2017). Through nurturing mentor-mentee relationships and networks among them, women would gain insights that they could use to improve their confidence levels while enhancing their professional network thus making it easier for them to address challenges within the ICT field as well as seizing opportunities.

2.6. Empirical Studies and Best Practices

2.6.1. Case Studies of Successful Women Entrepreneurs in Pakistan

Insights into the factors that contribute to success and resilience in the IT industry of women entrepreneurs in Pakistan can be gained by studying successful case studies (Afshan et al., 2021). Best practices and success factors that could be replicated and scaled to support other women entrepreneurs can be identified by researchers and policymakers through the analysis of experiences, strategies, and challenges experienced by these entrepreneurs (Roomi et al., 2018; Andriamahery & Qamruzzaman, 2022). The development and sustainability of women-led organizations in Pakistan's dynamic business environment are driven by such things as innovative business models, strategic alliances, and effective leadership as indicated by case studies (Khan, 2020). Case studies also speak about barriers to entry for IT sector such as mentorships, networks and resource accessibility.

2.6.2. Lessons Learned from International Contexts

International context's drawing lessons contribute valuable requirements towards encouraging women entrepreneurship's global practices. Researchers and policymakers may identify shared problems, new answers or successful policies that have been used in other countries to enhance empowerment of women economically as well as entrepreneurship through comparative research and cross-country analysis (Martínez-Rodríguez et al., 2022). Pakistan can therefore learn from experiences of other countries to adapt their strategies, programs and interventions accordingly using worldwide knowledge inputs or best practices to target IT sector women entrepreneurs' specific circumstances or challenges (Yunis et al., 2018).

2.6.3. Best Practices for Fostering Women's Entrepreneurship in Pakistan

It is important to identify and promote the best approaches that will encourage women's entrepreneurship in Pakistan. The first thing which needs to be done in order to create a supporting environment for women in IT sector is to understand the best practices for promoting them (Ramírez et al., 2021). Best practices include policy reforms, capacity building programs, networking platforms and other forms of interventions aimed at addressing systemic barriers as well as advancing gender equality in entrepreneurship (Ramírez et al., 2021). Some examples of good practices are establishment of incubation centers targeted at women, mentorship programs, and financial schemes designed specifically for women entrepreneurs (Mustafa et al., 2021). Furthermore, it is essential that collaboration between government, academia, industry and civil society be promoted when scaling up and implementing these best practices so as to have sustained impact on and empowerment of women entrepreneurs (Plotnikov et al., 2019).

3. Research Methodology

To penetrate into the subtleties of factors that influence the success of women's entrepreneurial ventures in Pakistan's IT industry, this research study has employed a qualitative methodology. These research approaches provide comprehension on how the participants see things as well as their experiences and contexts thus ensuring an over-all investigation on the topic (Creswell & Poth, 2016). Qualitative research allows studying multi-faceted phenomena and provides rich context specific data needed to understand complexities of Pakistani female entrepreneurship in IT industry (Merriam, 2009). It helps researchers to discover reasons behind why they are challenged in starting up businesses, why they persist and what they do to ensure survival in their business undertakings. In terms of understanding women entrepreneurs' success in Pakistan's IT industry, qualitative methodology is vital because it helps unravel these unique socio-cultural, economic and institutional forces (Denzin & Lincoln, 2018). This research paper takes a qualitative approach with a view to contributing refined insights for targeted interventions and policy-making aimed at promoting women entrepreneurship as well as gender inclusive entrepreneurship in ICT industries.

3.1. Research design

Justifiably, qualitative is the best approach to explore the subjective experiences and perceptions of female incubates in Pakistan's IT business hence shed light into their entrepreneurial process that might be having complex dynamics (Creswell & Poth, 2016). This approach helps provide a deeper understanding of contextual factors that contribute to women's successful participation in entrepreneurial activities which quantitative methods may not capture thoroughly. In this research study, following scarce attention given to women entrepreneurs within Pakistan's IT industry, an exploratory standpoint by presenting new insights and perspectives (Merriam, 2009). The exploratory character of the research allows researchers to identify main themes as well as patterns and issues for further research and interventions targeting at supporting women entrepreneurs.

Yin (2018) notes that the employment of case study methodology enables researchers to investigate IT industry individual experiences and contexts comprehensively. Through this method, analysts can explore intricacies associated with women entrepreneurs' business journeys encompassing their relations with incubators programs, structures of companies and external factors. In order to ensure relevance and depth in the research study, female incubates were selected as participants who are actively involved in entrepreneurial ventures within the IT industry (Baxter & Jack, 2008). This research was aimed at obtaining firsthand knowledge about various challenges, successes and strategies used by women entrepreneurs from Pakistani IT industry specifically.

3.2. Research approach

The research is based on a qualitative inquiry of the intricate dynamics of women entrepreneurship in Pakistan's IT sector. The research study attempts to gain deep insights into experiences, challenges and strategies of female entrepreneurs by using such qualitative methods as in-depth interviews and extensive literature review. These qualitative approaches, according to Creswell & Poth (2016), provide depth and richness that help in probing multi-faceted factors affecting the success of women entrepreneurs resulting into a nuanced understanding of their endeavors within Pakistan's IT industry.

This research takes deductive approach which aligns with structured investigation and hypothesis testing that are derived from already existing theories on women entrepreneurship and venture success (Bryman 2016). This deductive approach allows systematic testing of hypotheses about the determinants behind the success of women's entrepreneurial ventures in IT sector of Pakistan. Thus, it aims at providing strong insights into relationships

among various factors and venture successes using well-articulated theories and concepts that would contribute towards the theory advancement as well as practical implications for supporting women entrepreneurs (Jackson et al., 2015).

3.3. Data Collection Methods

Female incubates in Pakistan's IT industry face numerous challenges and experience different perceptions, which can only be explored using in-depth interviews (Denzin & Lincoln, 2018). They are a way through which participants may express their thoughts easily while at the same time allowing researchers to examine certain key issues. Moreover, it is possible for researchers to adjust the questions according to the responses of the respondents hence making them collect comprehensive information (Bryman, 2016). The aim of conducting in-depth interviews is to ascertain some of the reasons that make women entrepreneurs be successful or fail. This involves looking into their interactions with incubator programs, organizational dynamics and external problems. The discussions held between a single researcher and one participant gives room for insights that might not have been recorded in other ways of gathering data (Merriam, 2009).

Rubin and Rubin (2011) posit that it is essential to develop a structured interview protocol, in order to ensure consistency and relevance in the collection of data. The interview protocol acts as a guide for the interview process by outlining the main areas of discussion, questions as well as probes but still allowing room for flexibility as themes may emerge. In this way, researchers can use a well-constructed protocol to keep interviews directed towards their research goals, while also giving room for individual perceptions from participants. The concept of document analysis refers to a systematic review and interpretation of documents such as reports, policies, research papers and organizational documents used alongside interview data (Bowen 2009). On this note, analyzing documentations on women entrepreneurship, incubator programs and IT industry policy regarding these three factors would give new insights about what determines success or failure in Pakistani women's entrepreneurial ventures (Baxter & Jack, 2008).

The choice of documents to be considered is directed by how they are linked with the aim of this research study and what they have been able to reveal about female interactions in the entrepreneurship arena as an IT industry. These documents are carefully studied by researchers who extract relevant information and establish patterns that repeat themselves revealing similar revelations found from interviews among other sources (Bowen, 2009). Findings on document analysis if combined with interview data give a complete picture of what makes women entrepreneurial ventures successful. In order to enhance validity and reliability of findings through providing multiple perspectives, researchers can consider collecting data from different sources thus offering nuanced insights into the topic under review (Bryman, 2016).

3.4. Sampling Strategy

Female incubates who are part of the IT industry in Pakistan, taking into account, the importance and depth of this research study, were selected using purposive sampling (Patton 2014). The reason for choosing female incubates is their unique perspectives and experiences as participants in entrepreneurship programs which can provide insights into factors affecting venture success. Inclusion criteria may include degree of involvement in incubator programs, period of operation in business venture and variety among business models and experiences (Creswell & Creswell, 2017). Data saturation is achieved through determining sample size where no new information emerges from additional interviews thereby covering all relevant themes (Guest et al., 2006). Sample size flexibility allows adjustments to be made based on emerging findings during data collection to ensure adequacy and richness of collected data (Patton,2014).

3.5. Data Analysis Techniques

The process of thematizing data is carried out by seeking out discernable patterns and themes in the qualitative data, which helps to organize and make sense of a vast amount of complex information (Braun & Clarke, 2006). Data is broken down into categories that have meaning through coding procedures, thereby allowing for systematic analysis concerning recurrent themes and ideas. To go further in understanding the research phenomena constant comparative analysis requires that researchers compare data within cases and from one case to the other to establish similarities and/or differences (Glaser & Strauss, 2017). Consequently, it allows researchers to fine-tune emerging theories and themes on an ongoing basis. Adding it involves bringing together outcomes from many sources such as interviews as well as document analyses to improve research study reliability including validity aspects (Denzin, 2017). Another way that conclusion can be strengthened would be comparing findings from different sources so as to support each other or strengthen their interpretations.

4. Findings and Analysis

4.1. Introduction to Data

A comprehensive examination of the data collected through interviews with female incubators working in Pakistan's IT industry is presented. The goal was to look at factors that make women-led IT startups successful and sustainable especially after their time in an incubator. Data was gathered by conducting open-ended interviews with ten women entrepreneurs that had left the incubation process recently. From these interviews, it emerged that budding businesses went through different phases such as making attempts to start them off, running them and

transitioning beyond the just exiting point of incubation. Thematic analysis was used to discover patterns and recurring themes in data; specifically, on sustainability, post-incubation challenges and recommendations for improvement (Braun & Clarke, 2006; Guest et al., 2006). This made it possible to have a more detailed understanding of the specific ways that hinder or help female business owners in Pakistan's information technology space while being consistent with Creswell & Poth's (2018) approach to qualitative data interpretation. These findings have been discussed within the existing literature enhancing research development and highlighting gaps in knowledge.

4.2. Themes Identified from Interviews

4.2.1. Determinants of sustainability

4.2.1.1. Access to Capital

The accessibility of capital is a core factor determining sustainability and growth of women-run start-ups, specifically for IT ventures. Ten female entrepreneurs were interviewed and this issue was quite visible throughout their interviews as it does appear in the literature.

4.2.1.2. Gender Bias in Funding Opportunities

Difficulties in accessing investments is due to repeated gender discrimination. This school of thought is upheld by Graham et al. (2015) when they stated that women entrepreneurs are subject to systemic biases which hinder access to venture capital. In participant 3's perspective, the plan was solid and the market opportunity appeared huge but investors still did not come on board as early as anticipated. Furthermore, this sector's gender-based biases may lead investors to unconsciously prefer men or lack faith in women's leadership capacity for their firms (Graham et al., 2015). These stereotypes reduce not only possible sources of funds but also limit business growth prospects. A case in point can be taken from the experience of participant 8 who argues that ladies have more stringent prerequisites because money lenders would question their ability to run thriving businesses competently. However, Nasir et al. (2019) suggested that addressing such imbalances demands explicit tools including investor diversity training and all-inclusive funding so as to give women entrepreneurs a level playing ground regarding access to capital and expansion pathways.

4.2.1.3. Challenges with Financial Institutions

Another challenge faced by women entrepreneurs in Pakistan is the gelling desired loan from financial institutions due to certain stereotypes and socio-cultural norms. Also, Participant 8 in the research faced similar problems because she met tough conditions. Consequently, the contemporary research study found out that women business owners have more challenges in borrowing than men (Robb & Coleman, 2010). For example, financial institutions may demand very strict borrowing terms such as more security or elaborate business proposals which are usually hard especially for ladies who may not know many people or cannot access significant amount of money (Abd Rani & Hashim, 2015). Furthermore, there was also a problem of rejection of Participant 4 loan application due to lack of collateral making acquisition of required funds tougher. However, these barriers do not only obstruct start-ups but also slow growth and scaling up of women's businesses. In conclusion, these difficulties necessitate revisiting credit policies by financial institutions in order to accommodate female entrepreneurs with diverse difficulties hence promoting equal credit access through all possible ways.

4.2.1.4. Financial Management and Planning

Additionally, it was found in the interviews that once the capital is secured, effective financial management and planning are essential for business continuity. For instance, Participant 2 spoke about budgeting and financial planning as a way of managing cash flow and ensuring sustainable business enterprise. This idea is supported by Zaidi et al. (2023) who argue that strong financial planning helps one navigate the intricacies of running a business. Poor financial management can hinder well capitalized firms from experiencing any serious problems such as cash flow difficulties or inefficiencies in use of resources. Likewise, Participant 7 indicated this during an interview citing lack of budgeting leading to some operational stability problems which impedes growth opportunities. Financial illiteracy and strategic planning must be considered by any entrepreneur because they are very important concepts in entrepreneurship. This makes them forecast their expenses, allocate their resources wisely while also preparing for unforeseen financial challenges hence guaranteeing long-term survival. Consequently, having comprehensive financial strategies can help mitigate risks within women-led IT start-ups thereby enhancing their overall resilience and success (Glantz, 2014).

4.2.1.5. Strategies for Overcoming Capital Barriers

Nevertheless, even with above challenges, some participants expressed the ways in which they overcame the hindrances to accessing capital. Participant 4 for example, could rely on their savings and turn to other sources such as angel investors and crowdfunding platforms to raise funds. Women entrepreneurs are beginning to look for alternative sources of funding rather than traditional barriers (Kanze et al., 2018). Furthermore, by employing networks and partnerships to obtain funds participant 7 exemplifies the significance of establishing strong professional connections and consulting with mentors or industry contacts. The discussed approaches facilitate both access to financial resources and give direction from experienced practitioners. These strategies can enable women overcome gender-based discrimination within entrepreneurial space. Besides, the increasing popularity of crowdfunding platforms demonstrates a movement towards more inclusive financial systems that empower female

innovators despite systemic financial barriers. These alternative methods show resilience plus flexibility that are crucial traits when starting an enterprise amidst hostility in the environment.

4.2.1.6. Policy Implications and Recommendations

Policy interventions and support mechanisms are necessitated by the difficulties that female entrepreneurs encounter while attempting to access capital. There is an urgent need for gender-targeted financial products and services as Kiva (2021) posits in order to meet the specific requirements of women entrepreneurs. Ventures like gender-focused venture capital funds and specialized loan programs can help mitigate these disparities and create more equitable funding opportunities for them. Furthermore, giving women knowledge through literacy on financial matters can enable them to maneuver through complicated money terrains with ease. Policymakers must partner with financiers to foster an environment that promotes success of women-run businesses by addressing existing structural prejudices against women while ensuring accessibility to monetary resources. These focused measures resulted in a more inclusive entrepreneurial ecosystem that encourages not only female business starts but also enables them maintain and scale their ventures, thereby having a greater impact on the wider economy in terms of both growth and equality between genders.

4.2.1.7. Budgeting and Financial Planning

To ensure that female igniting enterprises have a lengthy stay in business, budgeting and financial planning are vital (Modaffari & Sevilla Guzman, 2024). For example, after interviewing ten female entrepreneurs, the interviews showed that although it is important for them to have sufficient funds at the start of their businesses it is very crucial that they engage in strong financial management practices for long term success and financial stability. Participant 2 exemplified this when she explained how a lack of proper budgeting caused cash flow problems which made reinvestment into the business almost impossible. This corresponds to research focusing on establishing efficient financial plans for better resources management and continuation of operations (Glantz, 2014). The participants emphasized extensively on well-detailed budgets, regular reviews of finances as well as strategic financial planning for dealing with uncertainty among currencies in any given market environment. The section also highlighted key findings from interview data that relate to budgeting and finance and back up earlier studies, thereby contributing to a more comprehensive understanding of what constitutes effective finance management in terms of sustenance of business activities or operations.

4.2.1.8. Importance of Budgeting

Fund management has seen the rise of budgeting since ages. Individual's second experiences demonstrated this practice. She demonstrated that how poor budgeting resulted in severe cash flow problems, which in turn limited her ability to reinvest and scale her business. It is similar to Hisrich and Ramadani (2017) who observed that good budgeting allows owners to allocate resources properly, control expenses and be ready for financial uncertainties. Companies without comprehensive budgets are more likely to face financial issues resulting into decline in growth rate and operational strength. Additionally, lack of proper budgetary allocations can cause unexpected deficits that distract entrepreneurs from strategic planning in order to enable them solve an immediate money problem. Such disruptions stand as barriers that impact negatively on both the ability for growth as well as the overall resilience of a business entity. Therefore, incorporating thorough and reasonable budgeting mechanisms is a necessity for sustainability as it provides stability within which entrepreneurial endeavors can occur successfully over time.

4.2.1.9. Financial Planning for Sustainability

In order to ensure the sustainability of their businesses, financial planning involves determining future financial needs and working out strategies to address such. For example, Participant 5 stated that she had not been able to accurately anticipate her venture's growth due to lack of enough finances. This is echoed by Beck and Demirguc-Kunt (2006) who insisted that strategic financial planning enables entrepreneurs to be ready for any unforeseen challenges and provides long-term financial security. It allows firms to deal with fluctuating market situations, develop growth opportunities and maintain operational flexibility. If forecasts are inaccurate, a company will face unanticipated shortfalls which may undermine its stability and obstruct its strategic initiatives. By projecting future development scenarios financially and getting ready for them in advance, business owners can minimize risks associated with uncertainty, secure necessary resources, or get advantages from possible opportunities. Thus, sustaining growth requires strategic planning based on the idea of maintaining sound financial condition overall in entrepreneurial companies.

4.2.1.10. Cash Flow Management

Participants consistently said that cash flow management is a major problem. For instance, the cash flow fluctuation prevented Participant 3 from paying for day-to-day expenses and making new investments (Alfaro et al., 2021). This idea of Bai et al. (2021) supports the significance of effective business liquidity as well as maintenance of both operational and growth requirements. Thus, effective management of an entity's cash flows enables it to meet its short-term financial obligations, invest in viable opportunities, and sail through financially uncertain times. Mismanaged cash flows present an opportunity cost whereby there is failure to grow or take advantage of better opportunities at this time leading to difficulties in meeting critical expenditures required for day-to-day running of an organization, hence instability. Consequently, accuracy forecasting and proactive financing strategies are needed for efficient inflows and outflows control. This is important to ensure the continuity

of business operations such as paying employees' salaries without any delay or defaulting on mortgage payments among other bills that need attention at all times (Davis et al., 2016). It is therefore important that organizations keep their operations going and have long term goals supported by maintaining continuous positive income flows.

4.2.1.11. Resource Allocation

For sustainability and competitiveness, a viable enterprise must do well in financial planning, particularly in a volatile industry such as information technology. Participant 7 revealed that instead of just managing her human resources carefully, she had to take into account prudent management of finances. She understood that the strategy was to put money where it would generate business growth rather than wasting it on other areas. This harmonizes with Kaplan and Norton's (2002) view that effective allocation of resources should be consistent with strategic objectives for better performance and continued competitive advantage. Kaplan and Norton's framework also indicated that firms need to allocate their resources properly in order to achieve long-term goals and make optimal use of available assets. By giving priority to investments in high growth potential areas, while managing costs tightly over less significant functions, companies would enhance operational efficiency while maintaining financial stability hence fostering long term prosperity and resistance in competitive environment.

4.2.1.12. Challenges in Financial Management

There were several participants who encountered few problems in managing their finances, especially groups of people that are able to predict well and take care of unexpected financial emergencies. Participant 6 stated that her business was not prepared for sudden market changes or operational disruptions meaning that flexible financial planning is needed. The results by Hasanudin (2024) indicate the need for businesses to anticipate and prepare for financial risks as a way of ensuring efficient management of resources. According to Hasanudin's study, enterprises ought to adopt an adjustable mechanism which can enable them operate normally in case of uncertainties thus giving them the ability to withstand any anticipated eventuality. Having contingency plans and enough emergency funds is therefore crucial as it helps entrepreneurs manage times when there is no clarity on how their businesses stand financially viable. It means that if companies adjust their focus on potential financial risks, they would be better placed for cash flow management besides avoiding major interruptions thereby promoting long-term growth. This not only prepares companies for short term challenges but also puts them in a position where they can exploit opportunities when markets are volatile.

4.2.1.13. Recommendations for Improvement

The interview findings led to some recommendations on how budgeting and financial planning could be improved. The respondents stated that the most efficient way of doing it is by adopting more advanced financial management tools that enhance the precision and forecast of budgets. On top of this, entrepreneurs can have their decision-making process bettered if they employ software which provides financial insights in real-time. Additionally, it was suggested that seeking advice from professional in finance would help ensure that budgeting and planning are done in accordance with the best practices as well as industry standards. Moreover, involvement with accountants or financial advisors will give a useful perspective regarding proper management of finances. Finally, contingency plans should be made to address unanticipated fiscal constraints so as to promote resilience and adaptability. This means setting aside funds for emergencies and having strategies in place to respond to potential disruptions thus guaranteeing business continuity. According to Seville et al., (2015), preparedness for financial uncertainties is vital for maintaining stability while achieving growth objectives. Implementation of these recommendations will assist female entrepreneurs tackle financially intricate circumstances thereby enhancing the sustainability prospects of their enterprises in the long run.

4.2.2. Challenges post-incubation

For women in business, shifting from incubation to profitability is not easy, especially for those in the IT industry. The challenges that are experienced by these people after leaving such centers as documented through personal experiences and other recent studies.

4.2.2.1. Limited Access to Advanced Networking Opportunities

As one of the main problems, there were few chances for people to access advanced networking opportunities. According to Participant 5, incubation programs could create networks at first but they are difficult to keep and grow beyond incubation stage. This is consistent with Busch's and Barkema's (2022) research which found out that entrepreneurs often find difficult to sustain networks and relationships formed during their incubation period. Business growth depends on networking as a means of finding new business opportunities, also it facilitates partnerships as well as market expansion (Sutrisno, 2023). Absent strong networks, the prospect of growth can be stunted while benefiting from new openings would be sluggish.

4.2.2.2. Difficulty in Securing Follow-Up Funding

Another major hurdle was to secure follow-up funding. The eighth participant spotlighted this discrepancy between a good value business model and initial success that upon graduating from an incubator made it difficult for entrepreneurs to raise additional funds. It is not only the case that female-led ventures face problems mostly because of perceived risks and biases but also a reflection of wider trends in entrepreneurial finance (Noor et al., 2021; Swail, 2022). Insufficient ongoing financial assistance leads to restricted growth as well as limited possibilities for scaling up activities. Entrepreneurs are required extra resources to explore new markets and engage

in innovation but these opportunities may be lost without any further funding. For continued momentum and long-term success, Browne (2018) demonstrates why further investment is crucial. Mitigating these challenges through focused financial programs on addressing funding gaps as well as educating investors about the prospects of female-led firms can foster sustainable development.

4.2.2.3. Navigating Market Competition

Many participants struggled after the incubation period due to increased competition in the market. Participant 7 indicated that they had a hard time competing with other players who were already established and therefore had more resources and presence in the market. This is because findings from Zahra's study (2021) reveal that startups are always highly challenged by well-entrenched firms, which have better positioning in the markets as well as more resources. The absence of strategic planning and support post-incubation can add to competitive pressures (Zaidi et al., 2023). However, these companies will have difficulties determining niche markets or innovative approaches, thus distinguishing them from entrenched industry rivals without the benefit of a continued mentorship and strategic guidance. Furthermore, Zaidi et al. (2023) stress on continuous market analysis and adaptive strategies for surviving turbulent competitive environments. If extended support such as advanced strategic planning and competitive analysis training is offered to these entrepreneurs, there is a possibility of these barriers being alleviated so that their businesses become even stronger against future threats from competitors.

4.2.2.4. Managing Operational Scaling

Scaling operations afterwards, was another hurdle faced by most of the respondents. Referee 3 noted that managing the increased operational demands with not the same level of support or resources availed during incubation was hard. Research by Noor et al. (2021) supports this, stating that scaling a business entails difficult changes in structure and operations that stretch resources and capabilities. In order to cope effectively with increased demands, entrepreneurs need to adapt their management practices and operations (Zaidi et al., 2023). Many entrepreneurs find it hard to maintain growth trajectory without strong infrastructure and support provided during the incubation phase. Scalability is also dependent on financial capital and strategic planning as well as making operational adjustments for larger levels of production, wider markets of customers, more complex supply chains among others. Zaidi et al., (2023) argue that there is a need for continuous learning process leading to capacity enhancement so that entrepreneurs can handle scale complexities thereby necessitating extended support systems beyond the incubation period.

4.2.2.5. Sustaining Mentorship and Guidance

The loss of mentorship support after leaving the incubation center, which previously provided valuable advice and guidance is noted by Participant 6. Many studies have shown that successful entrepreneurs need ongoing mentorship (Stroila et al., 2022). Consequently, post-incubation without this would be extremely tough in the face of complicated business problems or decision making. Mentorship is important for businesses that seek to grow and remain sustainable through provision of strategies, networks for growth as well as emotional support. Still, if they do not continue mentoring budding entrepreneurs may lack capabilities to make strategic plans, take decisions among many more other unforeseen challenges. This is evident from the absence of this kind of help during post-incubation periods when complex business issues are dealt with and informed resolutions made. A period like this demonstrates a necessity for structured mentor programs starting from post start up incubation time frames. A long-term partnership built on trust can guide entrepreneurs through market adaptation in terms of changing conditions, take advantage of emerging opportunities and remain competitive in its industries (Stroila et al., 2022).

4.2.2.6. Sustaining Growth

In particular, the transition from incubation to independent operation is a major challenge for women entrepreneurs who want to sustain growth. Participants such as Participant 7 note scaling issues and claim that these are because of insufficiency in strategic direction and inadequate financial resources. This section will focus on these challenges in order to tie them up with the relevant literature.

4.2.2.7. Lack of Strategic Guidance

What is more, female business persons find themselves in the same predicament as Participant 7 who was struggling with scaling operations: lack of appropriate strategic advice. Others argued that the incubation programs only provided a start-up phase but limited further mentorship on how to cope with growth. The discovery agrees with Khan's (2020) assertion that women-led startups are prone to challenges when scaling because they lack strategic direction and expertise. For instance, effective preparation is critical in making business expansions into new markets, expanding operationally and taking competitive positions (Carvalho, 2020). As a result of which entrepreneurs may have difficulty adapting their strategies for growth without never ending support and specialist counsel leading to inefficiencies in their operations and lost chances.

4.2.2.8. Financial Resource Constraints

Another critical factor that affected sustainable growth was financial constraints. Participant 7, among others, revealed that after the incubation period very little extra money came forth thus constraining them on expanding their operations. According to HolonIQ (2022), this problem is supported by recent literature showing that women entrepreneurs' businesses often experience growth capital constraints. The study by Groza et al. (2020) carried out in the United States found out that most women business owners have a hard time finding funds to expand as such

they are not able to invest in new technology or hire more employees for expansion into new markets. It means, these firms may fail to grow successfully and be sustainable in the long-run since their financial sources are limited. Absence of enough funds makes female entrepreneurs incapable of pursuing growth opportunities or responding to changes in market dynamics hence making it difficult for them to expand and possibly liquidate their businesses. Thus, targeted financing and support schemes can go a long way towards enabling these start-ups sustainably expand and survive over time.

4.2.2.9. Scaling Strategies and Operational Adjustments

Moreover, some participants talked about issues they had to face while trying to adapt their operations for the purpose of growth. In case of Participant 7, it was difficult to expand activities while sticking to quality and efficiency standards. This idea is also confirmed by Lange et al. (2023) who posit that scaling a business entails intricate changes in its structure and operations that are tough particularly if there are no sufficient resources and guidance available. Effective scaling demands entrepreneurs to implement sound operational strategies such as process optimization, productivity improvement; and managing increased demand (Hisrich & Ramadani, 2017). Without a clear strategy for scaling up, companies may find themselves in problems of coping with growth efficiently which would eventually mean having operational clogs as well as poor performance.

4.2.2.10. Adaptation to Market Changes

Another factor that was important in encouraging growth is adapting to changes in the market. According to the participants, as they grew up, this complicated staying competitive and reactive to market forces. Research by Lomineishvili (2021) reveals that entrepreneurs must constantly transform their strategies and operations so as to be able to compete in a dynamic market. Responding quickly and adopting new trends or challenges are necessary for sustainable growth leading to long term success. Some of the difficulties faced by women entrepreneurs with regard growth include lack of strategic guidance, financial constraints, difficulties with expansion and responding to variations in the business environment. The solutions for such issues will consist of ongoing strategic support, better access to funds, and efficient operational tactics. Policymakers; incubators; support organizations should work towards understanding these factors in their effort to enhance female entrepreneurship's sustainability level and consequently help achieve long-term success in this area.

4.2.2.11. Gender Bias and Societal Expectations

Societal expectations and gender bias are factors that greatly influence women who venture into IT market, and it is obvious from the interview with participant 9, as well as supported by literature. Moreover, they also affect business negotiations and customer acquisition in addition to affecting the performance of companies run by women.

4.2.2.12. Persistent Gender Bias

In the IT sector, gender bias is a recurring theme in regard to the struggles that women go through. In this regard, she narrated how she was faced with doubts and discrimination by potential customers and colleagues in the industry. This weakened her power of bargaining and efforts to acquire new clients. According to Khan et al. (2021), this finding is consistent with their study which states that female entrepreneurs face gender bias as a significant hurdle particularly in IT industries which are mostly male dominated. In various ways, gender bias can express itself such as questioning the technical skills of women; undervaluing them; or giving them less beneficial terms during negotiations (Kang et al., 2016). These biases act as barriers for women professionals in establishing and nurturing relationships professionally, acquiring business contracts and enlarging businesses optimally.

4.2.2.13. Societal Expectations

Other than that, societal expectations with reference to gender roles playing very vital influence on the experiences faced by female entrepreneurs. The ninth respondent mentioned how customary norms in society perpetually set women to particular roles that bar them from opportunities and create more barriers within the business field. This is consistent with Adikaram and Razik's (2023) findings that social expectations and traditional gender responsibilities restrict women's career opportunities resulting into further obstacles in business-settings. In Pakistan where conventional gender roles are most pronounced, these assumptions can have a huge bearing on women's ability to navigate entrepreneurial landscape (Khan et al., 2021).

4.2.2.14. Impact on Business Negotiations and Client Acquisition

Negotiations and client acquisition are the critical business functions that suffer from the impact of gender bias and societal expectations. Participant 9 had problems in these areas as a result of prejudice towards women who are leaders. The literature confirms this, with examples showing that women entrepreneurs often face challenges in signing favorable agreements or attracting high-end customers due to internalized prejudices (Padma & Don, 2021). For instance, research has proven that females frequently get less profitable agreement terms than their male colleagues and may be discriminated against in the marketplace impacting on their ability to close deals (Moss-Racusin et al., 2012).

4.2.2.15. Strategies for Overcoming Bias

However, female entrepreneurs employ different strategies to maneuver through and minimize the effects of gender bias. In Participant 9's case, this involved leveraging strong networks, seeking mentors who could provide support and guidance in overcoming these barriers. This is backed by research which points out that building strong

professional networks and having mentors can help women overcome industry biases and develop their business (Smith et al., 2011). That way, they can learn from experienced advisors who will mentor them as well as give them moral backing during hard times that come with such challenges. In addition, creating a supportive community and calling for systemic changes in the industry may reduce the impact of gender bias on entrepreneurial success (Kang et al., 2016). Such initiatives promote gender diversity, offer fair chances to all and challenge exclusionary practices to create an inclusive environment that allows growth and success of enterprises run by women. Especially since acting together for change is helpful not only for individual entrepreneurs but also for other businesses in general.

4.2.3. Recommendations for improvement

4.2.3.1. Enhanced Financial Support

Female entrepreneurs in the IT sector described a need for more funding as one of the major themes that emerged from the interviews. Women-led startups were often mentioned as requiring more customized financing programs to enhance their chances of survival and growth. Robb and Coleman (2010) agreed with this by arguing that targeted financial aid is necessary to address specific challenges faced by women founders. At the same time, participants also observed that there is still limited access to venture capital and grants for women-led start-ups. For example, despite having an amazing business model, Participant 4 noted that they were unable to secure venture capital which is a well-documented concern (Graham et al., 2015). Hence, it is found that lack of funds availability for females and insufficient support structure from government has led to many obstacles to the successful ventures, although may issues are effectively managed, such gender-specific financing initiatives could help alleviate these problems by offering accessible sources of funds specifically tailored towards female business starters (Robb & Coleman, 2010).

In fact, according to participants such as Participant 2 and Participant 7, their ability to take on and sustain a venture would be significantly influenced by a greater availability of risk capital and financial grants. It was noted by participant number 7 with reference to large research (Deliana, 2023) that lack of enough money impeded their plans of expanding the business. Grant programs and venture capital designed for women entrepreneurs can contribute towards startups in terms of finance as well as other resources like mentorship and networks (Robb & Coleman, 2010). In addition, thereof the IT industry is calling out for more funds because most start-ups require large amounts of money for tech development or getting into the market at all. This funding gap could be bridged through specific initiatives targeting women-led businesses (Robb & Coleman, 2010). Moreover, Khan (2020) argues that inclusive financial ecosystems will alleviate any gender biases hindering the access of women to capital.

4.2.3.2. Improved Post-Incubation Support

The interviews revealed that an important topic was the need for post-incubation support to female entrepreneurs. Although such incubation centers render important early assistance, their business continuity and growth depend on them. A number of them, like Participant 6, also talked about the importance of having mentors after one leaves the incubator. They said that this period usually comes with unique challenges which require continuous counseling and guidance. This need for prolonged mentorship was found in a study by Russell (2016), which highlights that mentorship is crucial in overcoming entrepreneurial barriers and achieving long-term success. More specifically Participant 6 noted that they achieved business growth through receiving some assistance from experienced mentors who provided them with advice, information about the industry and emotional encouragement so as to help solve problems associated with expanding their enterprises.

To grow networking opportunities beyond the incubation stage was another important suggestion. Participant 5 and participant 8 recommended that one of the most important things that entrepreneurs could do to improve their businesses is to maintain their professional networks. However, they also mentioned that this opportunity doesn't exist after start-ups had graduated from incubators. This idea concurs with other research that suggests that well-developed business relationships are very crucial in entrepreneurial success where it aids in resource mobilization as well as markets expansion (Kalafatoglu, 2018). Closing this gap might involve setting up targeted events such as women entrepreneur – oriented networking sessions. In addition, various participants called for more structured support programs offering help on a wide range of issues including business development or financing sources, operational capability among others. According to participant four, while there were initial helpful incubation support services, growth stagnated due to lack of post program follow up activities which should have been done differently over time. This is consistent with existing literature which posits that continued structured assistance is necessary for maintaining enterprises at start-up phase (Henry et al., 2017; Nasir et al., 2019).

In the end, there was a need for an improvement in resources which included but not limited to financial advice, marketing support and legal assistance. The respondents observed that after the incubation period most entrepreneurs have resource issues that can be addressed by specific intervention mechanisms. This is reinforced by literature where it is specified that continuous resource backing will importantly influence the establishment growth and enlargement of businesses (Kuckertz et al., 2015).

4.2.3.3. Training and Resources

From the interviews, it was clear that training and resources are very important in supporting female entrepreneurs in the IT business. This shows a consistent demand for more financial management classes as well as business strategies that can help them effectively operate their businesses. In line with this, Andriamahery and Qamruzzaman (2022) argue that financial literacy plays a crucial role in realizing success in entrepreneurship. Financial management is key to the wellbeing of their enterprises as stressed by other participants, such as Participant 4 and Participant 7. She experienced challenges budgeting and managing cash flow due to lack of training on financial management which led to poor allocation of resources hence she couldn't prepare well for future needs (Participant 4). The authors point out that sound fiscal planning and control lead to higher success rates in businesses over time (Muhammad et al., 2021). This will involve getting skills on how to handle complex financial issues like forecasting, budgeting, cash flow management among other such issues that are necessary for running business operations (Noor et al., 2021).

Strategic business training was also a major theme. The second participant noted that although the initial training given by incubators was helpful, there has not been any further training in strategic management and scaling. Consequently, it is difficult for enterprises to navigate through market dynamism and competitive pressure due to lack of this training. Strategic management skills are fundamental for entrepreneurs to respond to changing market conditions and develop effective growth strategies (Fauzi et al., 2022). Therefore, the improved courses should be concentrated on strategy planning, market analysis and competition positioning which will allow giving knowledge how to scale their businesses. To fill these voids in learning, participants suggested they must come up with comprehensive learning programs that have modules on financial management and business strategy. These initiatives must be designed with consideration for specific needs of women entrepreneurs and thus include practical exercises, case studies as well as mentoring sessions that reinforce the process of learning as well as application of lessons learnt (Leger et al., 2024). By increasing roles in these sectors, women will become more competent managers who can grow their businesses steadily. Female entrepreneurs need better instruction in this regard so that they may effectively handle their companies while simultaneously ensuring sustainable development."

4.3. Discussion of Findings

The results of the interviews have revealed a range of vital influences on the prosperity and sustainability of female IT entrepreneurs in Pakistan. These include access to capital, effective management of finances as well as post-incubation support. Any one of these items can be said to be the key element that defines entrepreneurial activities and as such, women-led enterprises in information technology sector can only survive if they excel in all of them. Among the participants', accessing capital has been identified as a huge problem. Interviews with many participants showed that obtaining finance was still too challenging for anyone. For instance, Participant 3 and Participant 8 stated that they experienced challenges when trying to attract investors or get loans because of gender biases like the many other researchers found before them. According to Graham et al. (2015), systemic funding prejudices which may hinder scaling up and sustaining business operations are common for women entrepreneurs. This is also what happened among the respondents hence emphasizing the need for targeted financial assistance packages and investment plans that deal with these inequalities between men and women.

Yet another major theme was the necessity of effective financial management in business. Participant 2 and Participant 7 have brought up that even if adequate initial funding is essential, long term sustainability necessitates a rigorous financial plan. This goes hand in hand with what has been found by Leger et al. (2022) when they noted how useful it is to have strong financial planning for managing resources as well as continuity of business. It is important to note that good practices in this area should include being able to make budgets, do forecasts and manage cash flow effectively since these are critical aspects of financial management for business purposes. Moreover, strategic financial oversight should be given priority by participant 7 who added that scarce resources need to be shared out correctly among the different activities of an organization so as to cater for any future emergencies. Thus, there is a need for more training and resources targeting female entrepreneurs towards enhancing their abilities to overcome financial difficulties. By availing access to finance management tools including professional advice, entrepreneurs are enabled to make informed choices on optimized strategies meant for realizing long-term success and survival rates within their establishments.

Crucial factor that affects the success of entrepreneurs is post-incubation support. Thereby being participants constantly argued that for them to overcome challenges experienced after leaving incubations there was need for continual mentorship and networking opportunities. Positive mentoring experiences taken by participant 6 illustrate the gains of continuous assistance in overcoming difficulties following an incubation period. The focus on developing strong post-incubation support systems has also been emphasized by Safdar and Qamar (2023) as they allude to the importance of ongoing mentoring and extensive networking as a means of achieving long-term business growth. These may include, among others: inability to upscale operations, stimulate new interests or address emerging market dynamics. As a result, so many entrepreneurs are able to keep going despite the fact that their businesses are growing at a fast pace due this enhanced post-incubation support. Incubators as well as policy

makers can positively impact female entrepreneurs through provision of mentorship networks and career related opportunities which enhance sustainable development and resilience within the competitive market structure. This prevailing research study discovered themes are congruent with existing literature on the causes and facilitators of women's business ownership. Furthermore, many other systemic challenges that confront female business owners are revealed by finance management difficulties and financing constraints (Graham et al., 2015; Nasir et al., 2019). For instance, such findings necessitate interventions aimed at addressing the issue such as enhanced financial assistance and improved financial management training. Better post-incubation support is called for as well, in line with previous research advocating continuous mentoring and networking (Noor et al., 2021). These findings also indicate a need for holistic systems of support that cater to unique problems encountered by women who venture into IT industry and facilitate their long-term success.

4.4. Comparison with Existing Literature

The findings from this research study are in line with and expand upon existing research literature regarding the difficulties as well as factors that affect women entrepreneurship success, particularly in emerging economies such as Pakistan. Such a contrast between empirical observations and standard theories and reports of investigation shows points of agreement while at the same time outlining areas for future investigations. Moreover, these challenges related to accessing capital resonate highly with existing literature. For instance, in their research studies, the authors noted that participants reported huge challenges when it comes to accessing funding due to gender biases and restrictive lending practices. Graham et al., (2015) found out that those women who venture into entrepreneurship are subjected to biased processes which hinder them from being considered for investment just like their male counterparts. Furthermore, Robb and Coleman (2010) argued that financial institutions needed more focused financial support initiatives to help fill the financing gap for start-ups led by women. In conclusion, these findings support the argument that there is nothing unique about the barriers to capital access experienced by females in this contemporary research study but rather confirms that these constraints form part of a wider pattern affecting female entrepreneurs worldwide.

The importance of effective financial management in sustaining business operations has emerged as a crucial success factor which is supported by Noor et al. (2021). There was consensus among participants that insufficient budgeting and financial planning led to considerable problems with cash flow management and growth sustainability Rehman and Azam Roomi (2012) argue that good financial management is key to long-term business performance, as shown by the experiences of informants in this research study. This similarity underscores why universal significance of financial literacy and planning for entrepreneurship achievement is always stressed while re-affirming the demand for specialized training targeting such areas.

Besides, this current research study has brought to the fore many challenges encountered by women post-incubation such as lack of networking opportunities and negative cultural attitudes. These problems are reiterated in the study by Muhammad et al. (2021) who argue for continued mentoring and networking help for entrepreneurs after incubation period. After leaving these incubation facilities, participants experienced difficulties in maintaining contacts and getting access to new business ideas, which is a wider issue earlier identified elsewhere. The entrepreneurial landscape is also complicated for women through societal biases and gender-related barriers mentioned in Khan et al. (2021) and Graham et al.'s (2015) research articles. Therefore, there is a dire need for strategic support system that takes care of both professional and social barricades. The continuing existence of these cultural barriers was expressed during interviews where most participants revealed about them aligning with other studies on culture, gender, entrepreneurship and society at large. Women's entrepreneurial efforts are hindered by societal expectations as well as cultural norms according to Khan et al. (2021) which also reflect the experiences shared by the participants in this contemporary research study. This connection highlights the ongoing need of changing culture through policies that favor women entrepreneurs.

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