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Examining the Role of University Entrepreneurial Ecosystem and its Influence on Entrepreneurial Self-Efficacy: An Analysis of Chinese Female Digital Entrepreneurs in Sichuan Province

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Abstract

The role of university entrepreneurial ecosystems (UEE) in shaping entrepreneurial outcomes has received extensive scholarly attention, yet limited research examines how regional heterogeneity within UEEs influences entrepreneurial self-efficacy (ESE) among socially underrepresented groups, particularly Chinese female digital entrepreneurs navigating the country's unique platform economy. This qualitative multiple case study addresses this gap by investigating how different types of universities—located in economically developed versus underdeveloped regions of Sichuan Province—shape ESE among Chinese female digital entrepreneurs. Drawing on Bandura's social cognitive theory, Saeed et al.'s (2015) three-dimensional UEE support framework (educational, concept development, and business development support), and Nambisan's (2017) digital entrepreneurship perspective, the study employs an interpretive multiple case design. Data will be collected through semi-structured interviews with 24–32 participants across four universities (two in Chengdu, two in Mianzhu/Luojiang), including female digital entrepreneurs, mentors, incubator staff, counsellors, and alumni entrepreneurs. Thematic analysis and cross-case comparison will be conducted using NVivo. Two theoretical propositions guide the inquiry: (P1) universities in developed regions with diversified subject portfolios are positively associated with female digital entrepreneurs' ESE, including digital self-efficacy; (P2) universities in underdeveloped regions with specialised major fields are positively associated with ESE primarily through community-embedded social networking and concentrated mentorship. Malaysia is incorporated as a regional comparative benchmark to contextualise findings. The study extends UEE theory by integrating regional heterogeneity and digital self-efficacy as analytical constructs, contributes to social cognitive theory through contextualisation within China's

platform ecosystem, and provides actionable implications for university resource allocation and Sichuan's digital economy policies.
Keywords: University Entrepreneurial Ecosystem, Entrepreneurial Self-Efficacy, Female Digital Entrepreneurs, Regional Heterogeneity, China

Introduction

Scholars and policymakers have dedicated considerable attention to the pivotal role that universities play in cultivating innovative and entrepreneurial environments at both national and regional levels (Guerrero et al., 2015; Lee et al., 2004; Rothaermel et al., 2007). Prokop (2021) contends that a university functions as an autonomous institution for generating knowledge, thereby developing its distinctive entrepreneurial environment — or *university entrepreneurial ecosystem* (UEE). Universities operate as central hubs for the creation of new businesses (Duruflé et al., 2018). While existing literature predominantly examines the influence of individual characteristics and educational programmes on venture creation by students or recent alumni (Bergman et al., 2016; Hayter et al., 2017), there is a growing scholarly emphasis on coordinating university programmes with the broader UEE (Wright et al., 2017).

Prokop (2021) posits that the UEE comprises a unique set of ties with local, regional, and national actors that a university builds and leverages for its commercialisation activities. Consequently, scholars are engaged in research to comprehend the underlying mechanisms of this phenomenon, particularly regarding how the UEE influences entrepreneurial intention (EI) and entrepreneurial self-efficacy (ESE) (Barbosa et al., 2007; Barral et al., 2018; Campos et al., 2021; Kristiansen, 2004). Elnadi and Gheith (2021) propose that individuals' positive perceptions of UEE can enhance their ESE and, in turn, meaningfully influence their entrepreneurial intentions.

Despite the growing body of literature on UEE, a critical gap remains regarding how different types of universities — located in economically divergent regions — differentially shape ESE among socially underrepresented entrepreneurial cohorts, particularly *Chinese female digital entrepreneurs*. Comparative insights from Malaysia, a regional emerging economy that has made significant strides in university-driven entrepreneurship policy and digital entrepreneurship adoption (Ahmad & Buchanan, 2015; Saoula et al., 2023), offer valuable lessons for contextualising the Sichuan findings. A bibliometric review by Jiang et al. (2024) further confirms that digital entrepreneurship, gender differences in ESE, and intranational disparities represent key understudied frontiers in Chinese women's entrepreneurship research — gaps this proposal directly addresses. This proposal addresses that gap.

Background of Research

Campos et al. (2021) suggest that the dynamics of each UEE shape the way in which its community produces entrepreneurial results. However, the extent to which UEE triggers business creation among its broader community remains insufficiently investigated (Moraes et al., 2018; Muscio & Ramaciotti, 2019). Building on these arguments, this proposal identifies a strong need to understand: (i) which UEE factors may cause short-term fluctuations or longer-term systematic change in ESE; (ii) which factors may negatively affect ESE; and (iii) which factors may not directly affect ESE but nonetheless reinforce general self-efficacy, enabling individuals to proactively manage their careers in dynamic environments.

The Malaysian Context as a Regional Benchmark

Malaysia provides a critically relevant comparative reference for understanding how university entrepreneurial ecosystems in an emerging economy context shape entrepreneurial outcomes. The Malaysian government has embedded entrepreneurship as a national strategic priority, mandating that public universities integrate entrepreneurship education across faculties and establishing dedicated entrepreneurship centres within higher education institutions (Ahmad, 2013; Ahmad & Buchanan, 2015). These efforts are institutionally anchored in the Malaysia Education Blueprint 2015–2025 and the National Entrepreneurship Policy 2030, both of which explicitly link university entrepreneurial ecosystem quality to national economic development.

Empirical research from Malaysian universities reveals that perceived university support — comprising educational, concept development, and business development dimensions — significantly influences students' ESE and, through it, their entrepreneurial intentions (Ambad & Damit, 2016; Saoula et al., 2023). Chin et al. (2024) found that entrepreneurial self-efficacy mediates the relationship between subjective norms and entrepreneurial intentions among Malaysian university students, with gender operating as an important moderating boundary condition — a pattern of particular relevance to this study's focus on female digital entrepreneurs. Wiramihardja et al. (2022) further confirm that self-efficacy, attitude, and opportunity recognition competency are key antecedents of entrepreneurial intention among Malaysian university students across diverse institutional contexts. In a broader emerging-economy context, Nguyen and Phan (2024) demonstrate that ESE fully mediates the relationship between perceived university environments and entrepreneurial intention — a pattern consistent with Saeed et al.'s (2015) framework and directly informing the mediating role of ESE posited in this proposal.

Female entrepreneurship within Malaysia's digital economy has emerged as a growing field of inquiry. Malaysian women entrepreneurs are increasingly leveraging social media platforms — particularly Facebook, Instagram, and TikTok — for digital business creation, customer acquisition, and product promotion (Ismail & Abdullah, 2023; Lee & Zubir, 2022). Mahmad et al. (2021) document that socio-cultural factors and access to institutional support significantly moderate Malaysian women's entrepreneurial capacity. The structural parallels with the Chinese context — where female digital entrepreneurs similarly navigate socio-cultural constraints within a rapidly digitalising economy — render Malaysia a highly instructive comparative case.

Furthermore, Malaysia's university entrepreneurial ecosystem research has highlighted the differentiated influence of institutional type and regional economic development level on entrepreneurial outcomes. Universities in economically developed states offer broader and more diversified entrepreneurship curricula, more robust incubation facilities, and richer alumni networks, while universities in less developed regions provide more specialised, community-embedded support (Zahari & Esa, 2025). This regional heterogeneity mirrors the Chengdu versus Mianzhu contrast central to this proposal. At the outcome level, Ayala-Gatán et al. (2024) provide longitudinal evidence that as UEE elements are progressively introduced, the probability of founding a business before graduation increases significantly — confirming that ecosystem maturity translates into measurable entrepreneurial action beyond stated intention.

Problem Statement

This proposal primarily applies Saeed et al.'s (2015) conceptual framework to operationalise the measurement of the university entrepreneurial ecosystem. This framework enables examination of: (i) what support the ecosystem provides to individuals at different stages of entrepreneurship; (ii) how such support may improve individuals' ESE; and (iii) whether such support is accessible consistently and over the long term, or whether structural barriers constrain acquisition.

The proposal focuses specifically on Chinese female digital entrepreneurs in Sichuan Province — a region with well-developed UEE infrastructure and industry–education integration leading the nation. Chan et al. (2015) noted that many individuals today establish businesses through information and communication technology and social media, constituting the phenomenon of *digital entrepreneurship*. Whereas entrepreneurs in Malaysia and Southeast Asia employ platforms such as Facebook, TikTok, and Instagram (Ismail & Abdullah, 2023), digital entrepreneurs in mainland China predominantly utilise Xiaohongshu, Weibo, and WeChat Video — an ecosystem with distinct sociotechnical characteristics requiring contextually specific analysis.

Women entrepreneurs play an important role in this field, as they demonstrate a capacity to leverage social capital and relational networks effectively within digital environments (Chan et al., 2015; Jiang et al., 2024). Recent empirical evidence from China confirms that digital competence exerts a significant positive effect on entrepreneurial intention among university students (Zhao et al., 2025), reinforcing the centrality of digitally-mediated ESE development in this study's conceptual model. From a research perspective, this proposal will advance understanding of UEE dynamics and assist universities in designing healthier, more supportive ecosystems. From a policy perspective, findings will have implications for future policies supporting women's entrepreneurship and employment — particularly within the ChengDeMian (Chengdu–Deyang–Mianyang) Industrial Economic Development Peak Zone.

Research Objectives

The overarching purpose of this study is to identify the role of the university entrepreneurial ecosystem and its influence on entrepreneurial self-efficacy among Chinese female digital entrepreneurs in Sichuan Province. Informed by Malaysia's experience as a regional emerging-economy benchmark, and applying Saeed et al.'s (2015) framework, this proposal aims to:

1. Assess the impact of individual UEEs across different university types (developed vs. underdeveloped Sichuan regions) on the ESE of Chinese female digital entrepreneurs;
2. Examine which UEE support dimensions (educational, concept development, and business development support) exert the greatest influence on ESE;
3. Explore structural barriers and enabling conditions that mediate UEE's influence on ESE in the Chinese context;
4. Draw on Malaysia's UEE research as a regional comparative frame to contextualise findings and generate transferable theoretical contributions.

Literature Review

Self-Efficacy and Entrepreneurial Self-Efficacy (ESE)

Bandura (1997) defines self-efficacy as an individual's belief in how effectively they can execute an action plan when faced with challenging situations. Chen et al. (1998) posit that entrepreneurial self-efficacy (ESE) is pertinent to an individual's confidence in establishing a successful enterprise, requiring commitment of effort and the accomplishment of challenging tasks. McGee et al. (2009) assert that ESE is a construct that gauges a person's belief in their ability to successfully launch an entrepreneurial venture. Boyd and Vozikis (1994) further conceptualise ESE as an important explanatory variable in determining both the strength of entrepreneurial intentions and the likelihood that those intentions will culminate in entrepreneurial actions. More recent empirical evidence confirms that entrepreneurial intention is significantly affected by entrepreneurial self-efficacy (Vivekananth et al., 2023).

Newman et al. (2019), in a systematic review, identify ESE's theoretical foundations in social cognitive theory, its multiple antecedents (including environmental and institutional factors), and its robust predictive relationship with entrepreneurial behaviour. More recently, Zhang and Chen (2024) demonstrate that entrepreneurship education positively influences ESE, and that ESE in turn mediates the relationship between education and entrepreneurial intention — with individual resilience (grit) amplifying this pathway. In the Malaysian context, Saoula et al. (2023) confirm that ESE significantly mediates the relationship between entrepreneurial motivation and entrepreneurial intention among students at Malaysian higher education institutions, underscoring its centrality as a mechanism through which institutional environments shape entrepreneurial outcomes.

Table 1

Conceptual Map of ESE Definitions Across Key Sources

Author(s)	Year	Core Proposition	Context
Bandura	1997	Self-efficacy as belief in capacity to execute action under challenge	Universal
Chen, Greene & Crick	1998	Confidence in establishing a successful enterprise	USA
Boyd & Vozikis	1994	Key variable predicting entrepreneurial intention and action	USA
McGee et al.	2009	Belief in ability to launch a venture successfully	USA
Elnadi & Gheith	2021	ESE mediates UEE perceptions → entrepreneurial intention	Saudi Arabia
Saoula et al.	2023	ESE mediates entrepreneurial motivation → EI	Malaysia
Chin et al.	2024	ESE mediates subjective norms → EI; gender moderates	Malaysia
Vivekananth et al.	2023	ESE significantly predicts entrepreneurial intention	Multi-country

Social Cognitive Theory as Theoretical Foundation

Bandura's (1997) social cognitive theory suggests that an individual's knowledge acquisition can be directly related to observing others within social interactions, experiences, and media influences. People develop cognitive, social, and behavioural competencies through observation and replication. Individuals with higher self-efficacy beliefs tend to demonstrate greater confidence and persistence when facing difficult goal-related tasks (Bandura, 1997). Bandura (1997) and Drnovšek et al. (2010) identify four primary pathways through which ESE develops. Co and Cooper (2014) identify mastery experiences as the most effective of the four pathways in developing ESE.

Table 2
Bandura's Four ESE Development Pathways — Mapping to UEE Activities

Pathway	Mechanism	UEE Activity	Malaysian Evidence
Mastery Experiences	Direct accomplishment builds perceived capability	Startup competitions, e-commerce projects	Entrepreneurship bootcamps in Malaysian HEIs (Ibrahim et al., 2025)
Vicarious Learning	Observing role models succeed or fail	Alumni speakers, mentor shadowing	Successful female digital entrepreneur role models (Chin et al., 2024)
Social Persuasion	Verbal feedback and encouragement from significant others	Faculty coaching, counselling, peer networks	Family and peer social norms in Malaysian HEIs (Saoula et al., 2023)
Physiological States	Emotional cues interpreted as capability signals	Wellbeing workshops, stress management	Identified as research gap in Malaysian UEE literature

Entrepreneurial Ecosystem and University Entrepreneurial Ecosystem

Moore (1993) defines business ecosystems as 'an economic community supported by a foundation of interacting organizations and individuals.' Isenberg (2010) conceptualises the entrepreneurial ecosystem as consisting of high-quality human resources, financial access, business-encouraging culture, leadership, effective policies, a wide range of institutional and infrastructural supports, and business-friendly commercial markets. This proposal adopts Spigel et al.'s (2020) definition of entrepreneurial ecosystems as 'the regional collection of actors and factors that all contribute to the creation and survival of high-growth ventures.'

Prokop (2021) identifies UEEs as primarily composed of: technology transfer offices (Fitzgerald & Cunningham, 2016), academic founders (Shane, 2004), investors (Huggins, 2008; Fini et al., 2017), experienced entrepreneurs (Franklin et al., 2001; Visintin & Pittino, 2014), and business incubators (Bourelos et al., 2012; McAdam et al., 2016), varying along a spatial dimension (Huggins & Prokop, 2017). In the Malaysian context, Zahari and Esa (2025) demonstrate that university roles — encompassing curriculum provision, mentorship, and incubation support — positively influence entrepreneurial competencies and student enterprise performance. Ambad and Damit (2016) establish that perceived educational

support and perceived structural support are significant determinants of entrepreneurial intention among Malaysian undergraduate students, aligning directly with Saeed et al.'s (2015) UEE support framework. In the Chinese context specifically, Ye et al. (2025) demonstrate that university support enhances students' entrepreneurial capacity, which in turn mediates the relationship between institutional backing and entrepreneurial intention — a finding with direct relevance to this study's focus on Chinese female digital entrepreneurs.

Beyond formally enrolled students, Nwosu et al. (2025) reveal that university entrepreneurial ecosystems also function through informal, peer-based pillars — perceived resource accessibility, community-based support, and entrepreneurial platforms — underscoring that UEE influence operates through both formal and informal channels that universities must recognise and cultivate.

The Three Dimensions of UEE Support

Saeed et al. (2015) propose that the manner in which the UEE stimulates entrepreneurial action can be categorised into three specific dimensions: perceived educational, concept development, and business development support. Saeed et al. (2015) find that perceived educational support exerts the highest influence on ESE, followed by concept development support, then business development support. Vodă and Florea (2019) note that different types of educational support stimulate self-efficacy differently. Complementing this, Ye et al. (2025) find that in China, university support operates through students' entrepreneurial capacity as a mediating mechanism — suggesting that UEE support must build tangible skills rather than merely providing information. Elnadi and Gheith (2021) empirically confirm that individuals' positive perceptions of UEE enhance their ESE. In Malaysia, Wiramihardja et al. (2022) similarly confirm that entrepreneurship education positively and significantly influences self-efficacy and entrepreneurial intention among university students.

Geographic Heterogeneity of UEE

In economically developed regions, universities tend to offer diversified subject portfolios (Abel & Deitz, 2012). A combined effect emerges where multiple universities co-locate in advantaged areas, resulting in curriculum diversification that fosters entrepreneurial activities (Kitagawa et al., 2021). In economically disadvantaged areas, universities tend to focus on specialised major fields (Teixeira et al., 2013). In underdeveloped regions, social networking as business development support positively affects business creation success rates (Bosworth, 2009), and social networking is positively related to an individual's ESE (Chen & He, 2011). In Malaysia, this regional heterogeneity is explicitly documented: universities in economically developed states offer broader entrepreneurship curricula and richer incubation ecosystems, while universities in less developed regions provide more specialised, community-embedded forms of support (Zahari & Esa, 2025).

Table 3
Comparative UEE Characteristics — Malaysia and Sichuan Regional Analogues

Dimension	Developed Region (Malaysia: KL/Selangor; China: Chengdu)	Underdeveloped Region (Malaysia: Sabah; China: Mianzhu)
Educational Support	Diversified curriculum; multiple entrepreneurship tracks	Specialised majors; vocationally-oriented content
Concept Development	Rich mentor/alumni networks; cross-disciplinary exposure	Concentrated mentorship; community-embedded guidance
Business Development	Abundant incubators; venture capital; e-commerce infrastructure	Social networking; community-based investment channels
Digital Ecosystem	Advanced platform infrastructure; industry-university partnerships	Emerging digital adoption via community networks
Women's Entrepreneurship	Government-backed programmes; female role model visibility	Social capital and family networks more prominent
Key Evidence	Zahari & Esa (2025); Ahmad & Buchanan (2015)	Ambad & Damit (2016); Mahmad et al. (2021)

Digital Entrepreneurship, Digital Self-Efficacy, and Chinese Female Entrepreneurs

Chan et al. (2015) identified that many individuals today establish businesses through information and communication technology and social media, constituting the phenomenon of digital entrepreneurship. In mainland China, platforms such as Xiaohongshu (Little Red Book), Weibo, WeChat Video, and Pinduoduo serve as primary channels for customer acquisition and brand building — constituting a unique sociotechnical infrastructure distinct from both Western and Southeast Asian digital ecosystems. Women entrepreneurs play an important role in digital entrepreneurship because they are skilled at leveraging social capital and relationship-based networks (Chan et al., 2015).

Critically, this study moves beyond a platform-level characterisation of digital entrepreneurship to engage with deeper structural constructs. Drawing on Nambisan's (2017) theorisation of digital entrepreneurship as a phenomenon shaped by digital artefacts, digital platforms, and digital infrastructures, this proposal recognises that the UEE's influence on ESE is necessarily mediated by individuals' **digital self-efficacy** — defined as an individual's belief in their capacity to effectively utilise digital technologies to identify opportunities, mobilise resources, and execute value-creating activities in online environments (Farani et al., 2017). This construct is analytically distinct from general ESE: a female digital entrepreneur may possess high general entrepreneurial confidence yet low digital self-efficacy if the UEE fails to provide adequate digital skills training, e-commerce mentorship, or live-streaming platform literacy support.

Furthermore, the concept of **digital capital** — encompassing the accumulated digital skills, platform networks, algorithmic literacy, and content creation competencies that entrepreneurs leverage for competitive advantage (Ragnedda & Ruiu, 2017) — is directly relevant to how UEE shapes female digital entrepreneurs' ESE trajectories. In the Chinese

context, the rapid commercialisation of short-video and live-streaming platforms (Weibo, Douyin/TikTok, WeChat Video) has created new pathways through which digital capital translates into business viability, yet also new barriers for women who lack institutional access to such skills. This proposal therefore examines not only whether the UEE provides entrepreneurship support in general, but specifically whether it builds the digital self-efficacy and digital capital necessary for female entrepreneurs to succeed in China's platform economy.

In Malaysia, analogous dynamics are observed: female digital entrepreneurs predominantly use Facebook, Instagram, TikTok, and Shopee for business creation, and their success is strongly mediated by access to digital literacy, institutional support, and the growth mindset required for technology adoption (Ismail & Abdullah, 2023; Lee & Zubir, 2022; Mahmad et al., 2021). Lee and Zubir (2022) specifically demonstrate that women microentrepreneurs' e-commerce adoption is driven by perceived ease of use and perceived usefulness — both of which map onto digital self-efficacy as conceptualised in this study. The gendered barriers Malaysian female digital entrepreneurs face closely parallel those documented in China, rendering Malaysia a valid comparative anchor for theorising how UEE design either amplifies or constrains digital self-efficacy among women. Chin et al. (2024) further confirm that gender moderates the ESE-mediated relationship between subjective norms and entrepreneurial intention in Malaysian university contexts, a finding with direct theoretical implications for this study.

Theoretical Framework and Hypotheses

Integrated Conceptual Model

Drawing on Bandura's (1997) social cognitive theory, Saeed et al.'s (2015) multi-dimensional UEE framework, and Nambisan's (2017) digital entrepreneurship perspective, and informed by comparative Malaysian evidence, Figure 1 presents the integrated conceptual model underpinning this study. The model guides the two research propositions developed in Section 6.2.

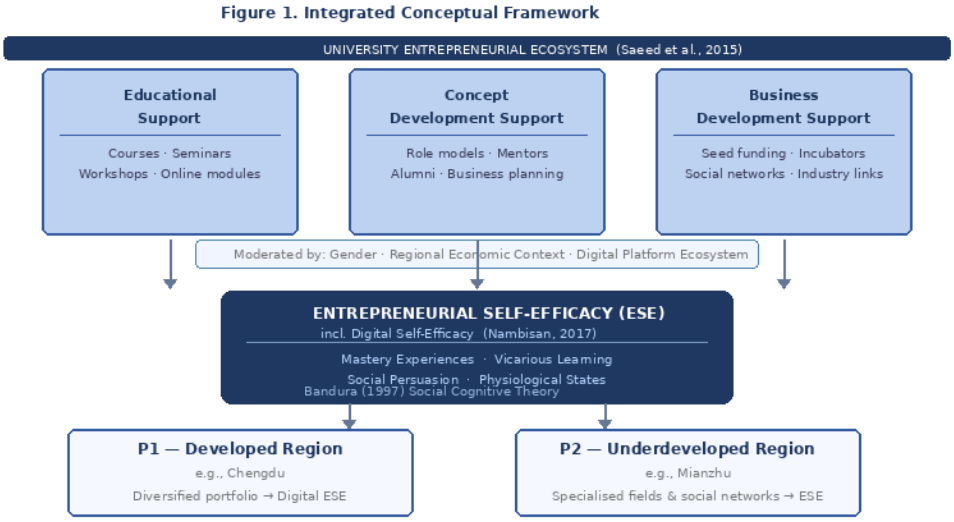

Figure 1. Integrated Conceptual Framework

Research Propositions

In keeping with the qualitative, interpretive epistemology of this study, the theoretical claims are expressed as **propositions** rather than hypotheses. Unlike hypotheses — which presuppose deductive testing against a null condition — propositions in qualitative multiple case study research serve as theoretical conjectures that guide data collection and analytical comparison, and are refined rather than accepted or rejected through the research process (Yin, 2018; Eisenhardt, 1989).

Proposition 1 (P1): A university located in a developed region of Sichuan (e.g., Chengdu) that provides a diversified subject portfolio has a university entrepreneurial ecosystem that is positively associated with the entrepreneurial self-efficacy — including digital self-efficacy — of Chinese female digital entrepreneurs.

Proposition 2 (P2): A university located in an underdeveloped region of Sichuan (e.g., Mianzhu) that provides specialised major fields has a university entrepreneurial ecosystem that is positively associated with the entrepreneurial self-efficacy of Chinese female digital entrepreneurs, primarily through community-embedded social networking and concentrated mentorship as the dominant support pathways.

Research Methodology

Research Design and Epistemological Position

This study adopts a qualitative, interpretive multiple case study design, consistent with the epistemological stance appropriate for exploring subjective perceptions, lived experiences, and contextual meanings that individuals attribute to their UEE and its influence on ESE (Patton, 1990; Yin, 2018). A qualitative approach is particularly suited because the constructs of interest — UEE perceptions and ESE — are experiential and socially constructed, and because the Chinese female digital entrepreneurship context requires thick, contextualised description rather than decontextualised measurement.

Site Selection and Sampling Strategy

Four universities in Sichuan Province will be selected using purposive sampling: two in developed regions (Chengdu) and two in underdeveloped regions (Luojiang and Mianzhu). This design enables systematic cross-case comparison across regional and institutional types, consistent with Yin's (2018) replication logic for multiple case studies. Figure 2 illustrates the sampling framework.

Within each university, participants will be recruited through a combination of purposive and snowball sampling across six stakeholder categories: female digital entrepreneurs, mentors, incubator staff, counselling staff, university-community liaisons, and alumni entrepreneurs. The target sample comprises 6–8 participants per university, yielding a projected total of 24–32 interviews across the four cases. This range is consistent with multiple case study norms in entrepreneurship research, where Prokop (2021) and Hayter et al. (2018) each conducted 20–35 interviews per multi-case study without compromising analytical depth.

Data saturation — the point at which no new themes emerge from additional interviews (Guest et al., 2006) — will serve as the primary criterion for determining when data collection is sufficient within each case. Saturation will be monitored iteratively: after every fourth

interview per university, emerging codes will be compared against existing codebook entries in NVivo. If three consecutive interviews yield no new first-order codes, saturation will be declared for that case. This iterative protocol ensures both rigour and efficiency, and prevents the arbitrary fixing of sample size prior to fieldwork — a common methodological weakness in qualitative UEE research (Kraaijenbrink et al., 2010). All participant categories are justified by Prokop's (2021) UEE actor typology and Saeed et al.'s (2015) three-dimensional support framework, which collectively require perspectives from both supply-side actors (universities) and demand-side actors (entrepreneurs) to triangulate UEE quality assessments.

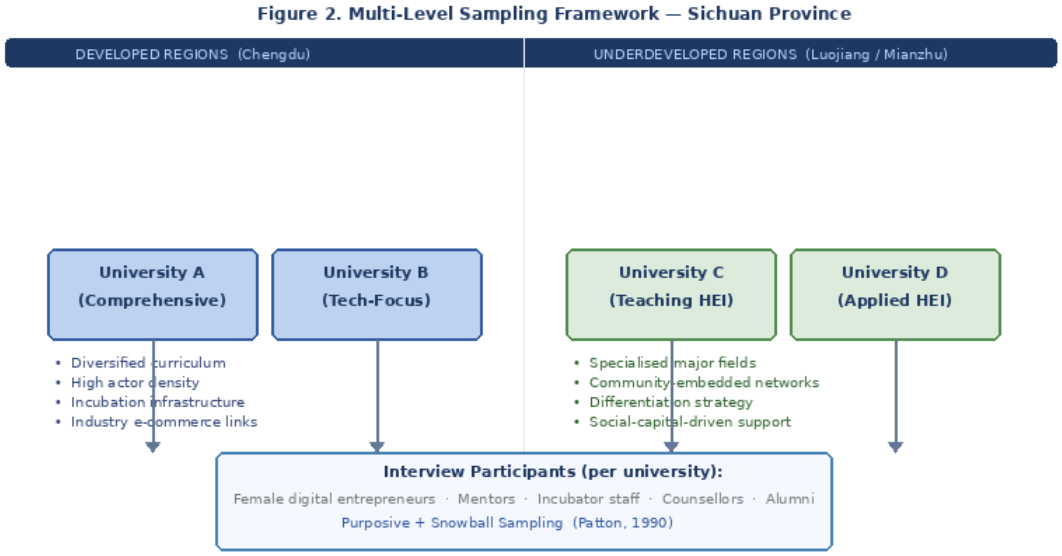

Figure 2. Multi-Level Sampling Framework — Sichuan Province

Data Collection

In-depth, semi-structured interviews will constitute the primary data collection instrument for the Sichuan fieldwork component. The interview protocol is structured around the three UEE support dimensions (Saeed et al., 2015) and the four ESE development pathways (Bandura, 1997), as illustrated in Figure 3. All interviews will be conducted in Mandarin Chinese, professionally transcribed, and subsequently translated into English for analysis. Audio recording will be conducted with informed participant consent following institutional ethics committee approval.

Importantly, the interview protocol incorporates a dedicated strand of questions on algorithmic perception and digital platform literacy — an area identified as theoretically underexplored in prior UEE-ESE research (Nambisan, 2017). Participants will be asked, for example: *'How do you understand the traffic recommendation logic of platforms like Xiaohongshu or WeChat Video? Has your university provided any guidance on content algorithms or platform strategy?'* Such questions are designed to operationalise the digital self-efficacy and digital capital constructs (Farani et al., 2017; Ragnedda & Ruiu, 2017) at the individual experiential level, capturing how UEE support either cultivates or neglects the algorithmic literacy increasingly essential to digital entrepreneurial success in China's platform economy.

The Malaysia comparative component operates through a systematic secondary source analysis rather than primary fieldwork. Published empirical studies on Malaysian UEE and digital entrepreneurship outcomes — including Zahari and Esa (2025), Chin et al. (2024), Saoula et al. (2023), Wiramihardja et al. (2022), Ambad and Damit (2016), and Mahmad et al. (2021) — will be synthesised using a structured narrative review protocol. This approach is consistent with established comparative case methodology in entrepreneurship research (Yin, 2018) and avoids overstating the scope of the study. The Malaysia evidence functions as an *analytical lens* to contextualise Sichuan findings rather than as a parallel primary dataset, thereby maintaining epistemological coherence while enriching transferability. This design decision is made transparent in line with Lincoln and Guba's (1985) confirmability criterion.

Figure 3. Data Collection Protocol Aligned to Theoretical Framework

Interview Domain	Theoretical Anchor	Sample Interview Questions
Educational Support	Saeed et al. (2015) Mastery Experiences (Bandura, 1997)	What courses or seminars provided by your university have been useful for your digital business?
Concept Development	Saeed et al. (2015) Vicarious Learning (Bandura, 1997)	Has mentoring or role model exposure changed how you develop your business ideas?
Business Development	Saeed et al. (2015) Social Persuasion (Bandura, 1997)	What incubator, funding, or network access has your university provided?
ESE Assessment	McGee et al. (2009) Chen et al. (1998)	How confident do you feel about launching and growing your digital business?

Figure 3. Data Collection Protocol Aligned to Theoretical Framework

Data Analysis

Qualitative data will be analysed using NVivo software, employing a thematic analysis approach following Braun and Clarke's (2006) six-phase framework. A cross-case comparative analysis will be conducted to examine similarities and differences across developed and underdeveloped regional UEEs (Yin, 2018). Figure 4 illustrates the analytical process.

Figure 4. Qualitative Data Analysis Process (NVivo)

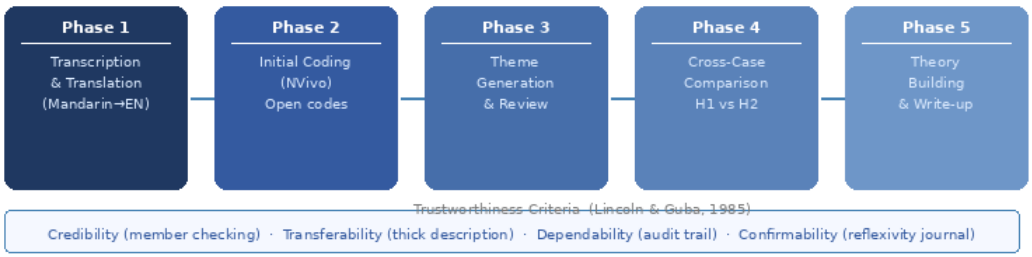

Figure 4. Qualitative Data Analysis Process (NVivo)

Trustworthiness and Rigour

To ensure trustworthiness in accordance with Lincoln and Guba's (1985) criteria, the following strategies will be employed:

Criterion	Strategy
Credibility	Member checking with interview participants; prolonged field engagement
Transferability	Thick description of each university UEE context; purposive site selection enabling analytical generalisation
Dependability	Audit trail of analytical decisions recorded in NVivo memos; supervisory review at each analytical phase
Confirmability	Reflexivity journal maintained throughout; peer debriefing with independent researcher

Research Significance

Theoretical Contribution

The primary theoretical contributions of this research are threefold. First, this study extends Saeed et al.'s (2015) UEE framework by examining it through the lens of regional heterogeneity, demonstrating how developed versus underdeveloped university contexts in Sichuan Province differentially shape ESE among female digital entrepreneurs — an underexplored dimension in existing literature. Second, this study extends social cognitive theory (Bandura, 1997) by contextualising its ESE development pathways within the Chinese digital entrepreneurial ecosystem, where unique sociotechnical platform environments and sociocultural dynamics operate distinctively. Third, this study contributes to the emergent literature on female digital entrepreneurship and UEE by focusing specifically on Chinese women — a cohort that has received substantially less scholarly attention than their Malaysian, Brazilian, or Saudi counterparts (cf. Elnadi & Gheith, 2021; Pelegrini & de Moraes, 2021; Saoula et al., 2023).

Practical Implications

From a university management perspective, the findings will equip universities in both developed and underdeveloped Sichuan regions with empirical evidence to reevaluate their UEE design, allocate resources more effectively, and develop more efficient entrepreneurial support systems to enhance ESE among female digital entrepreneurs. Consistent with Kitagawa et al. (2021) and Ayala-Gatán et al. (2024), the findings will also broaden understanding of graduate entrepreneurship retention, with direct actionable implications for talent anchoring in the ChengDeMian Industrial Economic Development Peak Zone. Furthermore, by situating digital competence alongside ESE within the UEE context, this study responds to Jiang et al.'s (2024) call for empirical research on the intersection of digital entrepreneurship and gender differences in ESE in China.

From a policy perspective, the study is closely aligned with two major active policy initiatives in Sichuan Province. First, the *Chengdu–Deyang–Mianyang–Ziyang Integrated Development Strategy* (成德眉资同城化发展战略, 2020–present) explicitly designates the four-city cluster as a pilot zone for coordinated higher education–industry integration, directly

relevant to this study's cross-regional UEE comparison. Second, Sichuan's *14th Five-Year Plan for Digital Economy Development* (2021–2025) prioritises e-commerce platform incubation, digital skills training for women returnees, and university–enterprise co-creation hubs — all of which map directly onto the UEE support dimensions examined in this proposal. The findings will generate evidence-based recommendations for how universities within this policy zone can optimise their UEE design to convert these macro-level policy commitments into ground-level ESE outcomes for female digital entrepreneurs.

The Malaysian comparative evidence further suggests that national-level policy coherence — such as Malaysia's National Entrepreneurship Policy 2030 — and institutional mandates for entrepreneurship education play a critical role in equalising UEE quality across regional types (Ahmad & Buchanan, 2015; Zahari & Esa, 2025). The lesson for Chinese higher education policy is clear: macro-level digital economy strategies must be translated into university-level UEE design standards, with explicit attention to the gendered dimensions of digital platform access and digital self-efficacy development.

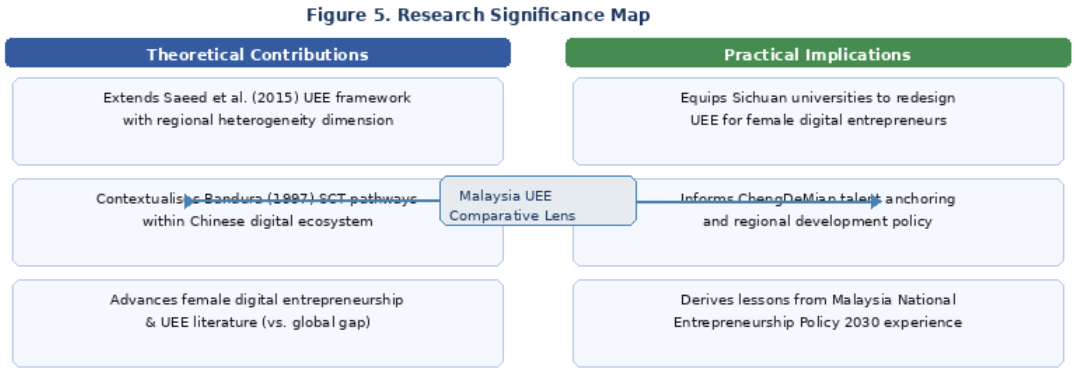

Figure 5. Research Significance Map

Conclusion

This qualitative multiple case study investigates how university entrepreneurial ecosystems (UEE) in economically developed versus underdeveloped regions of Sichuan Province shape entrepreneurial self-efficacy (ESE) among Chinese female digital entrepreneurs. Drawing on Saeed et al.'s (2015) three-dimensional UEE support framework, Bandura's (1997) social cognitive theory, and Nambisan's (2017) digital entrepreneurship perspective, the study proposes that universities in developed regions (e.g., Chengdu) with diversified subject portfolios are positively associated with female digital entrepreneurs' ESE—including digital self-efficacy—while universities in underdeveloped regions (e.g., Mianzhu) with specialised major fields are positively associated with ESE primarily through community-embedded social networking and concentrated mentorship. By integrating Malaysia as a regional comparative benchmark, the study situates Sichuan's UEE dynamics within broader emerging-economy patterns. The findings are expected to generate actionable insights for university resource allocation, policy design within the ChengDeMian Industrial Economic Development Peak Zone, and the cultivation of digital self-efficacy among Chinese women entrepreneurs.

Theoretical and Contextual Contributions

This research makes three distinct theoretical contributions to existing knowledge. First, it extends Saeed et al.'s (2015) UEE support framework by introducing regional heterogeneity as an explicit analytical construct. While prior applications of this framework have treated university support as relatively uniform within national or institutional contexts, this study demonstrates that the relative effectiveness of educational, concept development, and business development support dimensions varies systematically between developed and underdeveloped regional economies. Specifically, the study theorises that business development support—particularly social networking and community-embedded mentorship—assumes primary importance in underdeveloped regions where formal incubation infrastructure and venture capital are scarce, whereas educational and concept development support exert stronger influence in developed regions with diversified curricula and richer alumni networks. This regional contingency model refines UEE theory beyond one-size-fits-all prescriptions and responds directly to recent calls for intranational comparative UEE research (Jiang et al., 2024; Kitagawa et al., 2021). Second, this study contributes to social cognitive theory (Bandura, 1997) by contextualising Bandura's four ESE development pathways—mastery experiences, vicarious learning, social persuasion, and physiological states—within China's unique platform economy. The study theorises that digital self-efficacy, operationalised through algorithmic literacy, live-streaming competence, and platform-specific social capital (Ragnedda & Ruiu, 2017), mediates the relationship between UEE support and general ESE in ways not captured by conventional ESE measures.

This synthesis of digital capital theory with social cognitive theory addresses a critical gap identified in recent bibliometric reviews of Chinese women's entrepreneurship (Jiang et al., 2024). Third, by focusing on Chinese female digital entrepreneurs in Sichuan Province—a cohort substantially underrepresented in English-language entrepreneurship literature compared to their Malaysian, Saudi, or Brazilian counterparts (cf. Elnadi & Gheith, 2021; Pelegrini & de Moraes, 2021; Saoula et al., 2023)—this research contributes to the decolonisation of entrepreneurship studies by generating context-grounded theory from a non-Western, rapidly digitalising regional economy. The study's contextual contribution is equally significant. At the provincial policy level, this research provides the first empirical evidence base specifically linking Sichuan's Chengdu–Deyang–Mianyang–Ziyang Integrated Development Strategy (成德眉资同城化发展战略, 2020–present) to ground-level ESE outcomes for female digital entrepreneurs. The findings will inform how universities within this four-city cluster can differentiate their UEE investment strategies: developed-region universities (Chengdu) should prioritise cross-disciplinary digital entrepreneurship curricula and platform-industry partnerships, while underdeveloped-region universities (Mianzhu, Luojiang) should invest in community-based mentorship networks, peer-learning circles, and mobile-first digital literacy bootcamps adapted to local infrastructure constraints. At the institutional level, the study offers university administrators a diagnostic framework for auditing their current UEE support along three dimensions (educational, concept development, business development) and two regional contingencies (developed vs. underdeveloped), with specific attention to gendered barriers in digital platform access—an area currently absent from most Chinese university entrepreneurship programme evaluations. At the individual level, by documenting how Chinese female digital entrepreneurs perceive and navigate UEE support (or its absence), this research amplifies voices that are frequently marginalised in both entrepreneurship policy discourse and

platform economy research, thereby contributing to more inclusive digital development in Sichuan and beyond.

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