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Social and Human Capital Synergies: Toward an Integrated Model of Nascent Entrepreneurial Development

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ABSTRACT

Entrepreneurship is a socially embedded process influenced by the interaction between individual competencies and social frameworks. This research introduces an Integrated Model of Nascent Entrepreneurial Development (IMNED) that consolidates social capital and human capital as synergistic resources facilitating entrepreneurial emergence and initial success. Utilizing Resource-Based Theory (RBT), Social Network Theory (SNT), and Human Capital Theory (HCT), the model conceptualizes entrepreneurial development as an interactive process wherein knowledge, education, and skills (human capital) are activated and enhanced through network ties, trust, and social support (social capital). A quantitative, cross-sectional study was performed utilizing data from 420 emerging entrepreneurs in the technology, service, and creative sectors. Structural Equation Modeling (SEM) was utilized to examine direct, mediating, and moderating effects among human capital (education, prior experience, self-efficacy), social capital (network density, relational trust, information exchange), and entrepreneurial outcomes (opportunity recognition, venture readiness, and early performance). The findings indicate that social capital partially mediates the relationship between human capital and entrepreneurial outcomes, implying that knowledge is inadequate in isolation and must be integrated within socially cohesive networks. Additionally, human capital improves the quality of network use, showing that cognitive and relational resources work together in both directions. This study enhances entrepreneurship theory by integrating individual-centric and network-based perspectives, highlighting that nascent entrepreneurship is a co-evolutionary process involving learning, networking, and capability development. The consequences pertain to entrepreneurial education, incubator initiatives, and policy measures designed to cultivate inclusive and knowledge-based ecosystems.

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1. INTRODUCTION

Entrepreneurship has long been seen as a major force behind new ideas, competition, and changes in society and the economy. Nonetheless, the origins of entrepreneurial activity—especially in its early stages—are intricate and influenced by various individual and contextual factors. Academics are coming to the conclusion that successful entrepreneurial emergence depends not only on access to financial capital, but also on the interplay between human capital (HC)—the knowledge, skills, and cognitive abilities of individuals—and social capital (SC)—the resources embedded in social networks and relationships [1], [2]. Although significant advancements have been made, the synergistic relationship between these two types of capital continues to be theoretically disjointed and empirically insufficiently examined. This study aims to fill this void by formulating and validating an Integrated Model of Nascent Entrepreneurial Development (IMNED) that elucidates the interaction between Human Capital (HC) and Social Capital (SC) in shaping entrepreneurial outcomes, including opportunity recognition, venture creation, and initial performance.

Theories of entrepreneurship have transitioned from concentrating on individual characteristics to highlighting contextual embeddedness [3]. Human Capital Theory (HCT) asserts that education, training, and experience augment individuals' cognitive abilities and decision-making skills, consequently enhancing entrepreneurial performance [4]. Entrepreneurs possessing advanced education or specialized industry knowledge are more adept at recognizing market deficiencies, evaluating risks, and executing innovative solutions [5]. But just having human capital isn't enough for a business to be successful; it also needs social capital, which is access to resources, information, and trust through social networks [6]. Social Capital Theory (SCT) posits that networks, including familial, peer, mentor, and institutional connections, constitute essential relational assets that enhance the flow of information, confer legitimacy, and offer emotional support [7]. Nahapiet and Ghoshal [8] differentiated the structural, relational, and cognitive dimensions of social capital, each playing a distinct role in the entrepreneurial process. Structural ties give you access to partners and opportunities, relational ties build trust and give and take, and cognitive alignment helps you understand and share goals. So, entrepreneurs with a lot of social capital can use their connections and legitimacy to turn ideas into businesses [9].

But the relationship between HC and SC is often nonlinear and strengthens both. Human capital improves a person's ability to make and keep valuable relationships, while social capital provides the setting in which human capital is used, activated, and expanded [10]. In this context, entrepreneurship embodies a socially contextualized process of learning and exchange, rather than a solely individual pursuit. The nascent entrepreneurial stage, which is the time between recognizing an opportunity and starting a formal business, is an important but uncertain part of the entrepreneurial journey [11]. At this point, people gather resources, test their ideas, and build their credibility, often with little information and institutional help [12]. At this point, human and social capital are especially important because they provide the cognitive and relational support that lowers uncertainty and speeds up the process of starting a business. Davidsson and Honig's research [13] showed that new entrepreneurs who have more education and a wider network are more likely to be able to start a successful business. Arenius and De Clercq [14] also found that having access to informational and trust-based networks makes education more effective at helping people see opportunities. Nonetheless, these studies frequently analyze HC and SC in isolation rather than as interactive, interdependent constructs. This integrated perspective seeks to elucidate the interaction by analyzing how human capital facilitates the formation and utilization of social networks, and how social capital enhances the efficacy of human capital in attaining entrepreneurial outcomes.

Human Capital Theory (HCT): Developed by Becker [15], HCT posits that education and experience are investments that augment productivity and cognitive capacity. When it comes to entrepreneurship, it means that human capital makes it easier for someone to find opportunities and run a business [16]. Social Capital Theory (SCT): Based on the work of Bourdieu [17] and Coleman [18], SCT defines social capital as the total of real or possible resources that can be accessed through networks. Social capital offers informational pathways, normative assistance, and social trust—crucial components for emerging entrepreneurs operating in resource-constrained settings [19]. Resource-Based Theory (RBT) asserts that competitive advantage is derived from distinctive, inimitable, and synergistic resource configurations [20]. The interaction between human and social capital illustrates this synergy, as their amalgamation generates relational resources that are challenging to duplicate [21]. These frameworks collectively support the Integrated Model of Nascent Entrepreneurial Development (IMNED), which asserts that human and social capital function as interrelated, mutually reinforcing resources that influence entrepreneurial cognition, opportunity exploitation, and initial performance outcomes.

The combination of human and social capital creates ways for entrepreneurs to turn their individual skills into group action. Entrepreneurs endowed with substantial human capital have the proficiency to recognize opportunities; however, their capacity to capitalize on these opportunities is contingent upon access to complementary resources, including funding, mentorship, or strategic alliances [22]. Social capital functions as a conduit for the expression of human capital's economic and innovative potential. Empirical research indicates that entrepreneurs integrated within diverse networks demonstrate enhanced creativity and adaptability, as they can tap

into varied knowledge reservoirs [23]. But too much dependence on closed networks can stifle innovation because they have too much information that is the same. So, the best entrepreneurs find a balance between bonding social capital (trust within strong ties) and bridging social capital (access to new information across weak ties) [24]. This dual configuration improves entrepreneurial learning, helping new entrepreneurs improve their business models and their ability to organize resources [25].

The IMNED model (Figure 1) envisions this dynamic as a bidirectional synergy: human capital affects the quality and extent of social network development, whereas social capital amplifies the value of human capital through feedback mechanisms, including knowledge exchange, collaboration, and validation. Contextual factors, including institutional support, educational systems, and cultural norms, serve as moderating influences on the translation of social and human capital into entrepreneurial outcomes [26]. In developing economies with weaker formal institutions, social networks frequently fill institutional gaps by facilitating access to resources, market intelligence, and informal financing [27]. Cultural values, including collectivism, trust, and uncertainty avoidance, similarly influence how entrepreneurs utilize networks and acquire knowledge from experience [28]. This study examines entrepreneurs in specific contexts, providing insights into how institutional embeddedness influences the value of human and social capital. The results enhance context-sensitive entrepreneurship theory, highlighting that capital synergies function variably across sociocultural and economic contexts.

While extensive research associates human capital and social capital with entrepreneurial outcomes, three significant gaps remain:

Fragmented conceptualization: Numerous studies analyze HC and SC as distinct antecedents, neglecting their interaction and mutual reinforcement [29].

Limited focus on nascent entrepreneurs: Research primarily concentrates on established entrepreneurs or SMEs, overlooking early-stage founders who navigate significant uncertainty [30].

Absence of comprehensive measurement models: Limited empirical models concurrently encompass cognitive, relational, and structural dimensions of capital through robust multivariate methodologies such as SEM [31].

To fill these gaps, this study creates an integrated model that can be tested with real data and connects human and social capital to important entrepreneurial outcomes like recognizing opportunities, being ready to start a business, and early performance through mediating and moderating mechanisms. The suggested framework enhances a multi-dimensional comprehension of entrepreneurship by linking individual cognition with network dynamics. The rest of this paper is set up like this.

In Section 2, we look at the literature and come up with a new hypothesis based on old theories.

Section 3 explains the research methods, such as how the model was made, the scales used to measure things, and the way the data was analyzed.

Section 4 presents the empirical findings and examines their theoretical and managerial ramifications.

Section 5 ends with strategic suggestions, limitations, and ideas for future research.

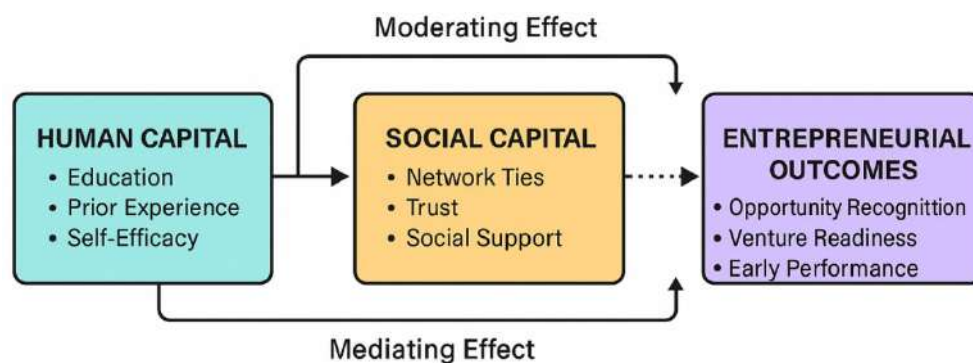


Figure 1. The IMNED framework

2. LITERATURE REVIEW

2.1. Conceptualizing Entrepreneurial Capital

Entrepreneurship encompasses more than mere innovation and risk-taking; it relies on the accumulation and mobilization of various forms of capital. Among these, human capital (HC) and social capital (SC) are the most important intangible assets that decide whether people can go from wanting to start a business to actually doing it [1]. Davidsson and Honig [2] call the combination of HC and SC "entrepreneurial capital." This is a mix of individual competence and relational embeddedness. Nonetheless, although the impacts of each type of capital have been thoroughly investigated, the interplay between human capital (HC) and social capital (SC) is still inadequately developed in theoretical frameworks and insufficiently explored in empirical research. This study

builds on Human Capital Theory (HCT) [3] and Social Capital Theory (SCT) [4] to propose an Integrated Model of Nascent Entrepreneurial Development (IMNED), which conceptualizes the two forms of capital as interactive, complementary, and mutually reinforcing resources. HC gives you the knowledge and skills to solve problems, while SC lets you use those skills in context through networks, trust, and social exchange [5]. This interaction is especially important at the beginning of an entrepreneurial venture, when resources are limited and there is a lot of uncertainty [6].

2.2. Human Capital and Nascent Entrepreneurship

2.2.1. The Nature of Human Capital

Human capital is the knowledge, skills, and cognitive resources that people have gained through education, training, and experience [3]. In entrepreneurship, it denotes a person's ability to recognize, assess, and capitalize on opportunities [7]. Research shows that education improves cognitive flexibility, while experience builds skills and the ability to take risks in specific areas [8]. Additionally, entrepreneurial self-efficacy, a psychological representation of human capital, positively affects opportunity recognition and venture persistence [9]. Unger et al. [10] demonstrated in a meta-analysis that entrepreneurs possessing more substantial human capital achieve superior performance outcomes, although this relationship is context- and industry-dependent.

2.2.2. Human Capital and Business Outcomes

Human capital directly influences opportunity recognition via information processing and creativity, and venture readiness through managerial and technical expertise. Marvel and Lumpkin [11] discovered that previous entrepreneurial or managerial experience enhances an individual's capacity to convert ideas into viable enterprises. Likewise, Rauch and Frese [12] established that entrepreneurs possessing robust cognitive and experiential resources are more adept at navigating uncertainty and fostering innovation. But human capital by itself is not enough. Entrepreneurs possessing significant expertise yet constrained social access may encounter difficulties in obtaining financing, legitimacy, and partnerships [13]. This suggests that social capital acts as a catalyst that converts human capital into concrete entrepreneurial results.

H1: Human capital has a positive effect on the success of new entrepreneurs.

H2: Human capital positively impacts the development and application of social capital among emerging entrepreneurs.

2.3. Social Capital and Embeddedness in Entrepreneurship

2.3.1. Aspects of Social Capital

Social capital refers to the existing and prospective resources inherent in an individual's network of relationships [4]. Nahapiet and Ghoshal [14] delineate three principal dimensions:

Structural capital: the overall pattern of connections (size, density, and diversity of the network);

Relational capital: how good those connections are (trust, norms, and give-and-take);

Cognitive capital: shared goals and understanding that make it easier to work together.

Entrepreneurs use these dimensions to get information, money, and credibility. Networks lower search costs, make it easier to learn, and create exchanges based on trust that lower risk [15]. Burt's [16] notion of "structural holes" underscores the strategic benefit derived from linking otherwise isolated groups—a stance frequently adopted by innovative entrepreneurs.

2.3.2. Social Capital and Business Growth

For new business owners, social capital is both a resource and a sign. It gives legitimacy in the early stages, which helps bring in investors and partners [17]. It also makes it easier to find new opportunities because networks give entrepreneurs access to a wide range of viewpoints and information flows [18]. Arenius and De Clercq's [19] empirical evidence demonstrates that network density and relational trust are significant predictors of early entrepreneurial engagement. However, an overdependence on closed, uniform networks can inhibit creativity and restrict access to innovative concepts [20]. So, the quality of social connections, not just the number of them, is what makes an entrepreneur successful. So:

H3: Social capital has a positive effect on the business outcomes of new entrepreneurs.

H4: Social capital serves as a mediator in the relationship between human capital and entrepreneurial outcomes.

2.4. The Relationship Between Human and Social Capital

2.4.1. Mechanisms that work together

Human and social capital are interconnected constructs. Entrepreneurs with high human capital are more likely to effectively establish and leverage social networks, as they possess the requisite communication skills, credibility, and technical expertise to sustain valuable connections [21]. On the other hand, strong social networks make human capital more powerful by giving people access to knowledge and resources that they don't have [22]. This interaction creates a two-way synergy: human capital makes it easier to build and use networks, while social capital gives human capital meaning and makes it work in real-life business situations [23]. The IMNED model asserts that these interactions collectively elucidate entrepreneurial outcomes more effectively than any single dimension in isolation.

2.4.2. Empirical Evidence for Capital Synergies

Davidsson and Honig [2] showed that the educational level of new entrepreneurs (HC) can predict the quality of their networks (SC), and that the quality of their networks can then predict the progress of their ventures. Likewise, Liao and Welsch [24] discovered that HC indirectly influences venture performance via SC, thereby validating a mediating effect. Theoretical extensions by Anderson and Miller [25] and Light and Dana [26] reinforce the idea that entrepreneurship arises from both social position and individual capability, rather than from isolated resource endowments. Consequently, we suggest:

H5: The interplay between human and social capital yields a beneficial synergistic impact on entrepreneurial results.

H6: The connection between human capital and entrepreneurial outcomes is partly influenced by social capital.

2.5. From Building Up Capital to Starting a Business

2.5.1. Recognizing Opportunities and Being Ready to Start a Business

The identification of entrepreneurial opportunities is a cognitive process based on prior knowledge (HC) and influenced by social interactions (SC) [27]. Entrepreneurs possessing advanced education and industry experience discern more lucrative and innovative opportunities, whereas networking interactions enhance opportunity assessment through feedback and validation [28]. This dual mechanism improves venture readiness by helping people combine what they know about their own skills with what they know about the market [29].

2.5.2. Early Performance and the Long-Term Success of a Business

Entrepreneurs depend on relational trust and resource exchange to keep growing in the early stages of their business [30]. Social capital makes it easier to work with investors, suppliers, and customers, while human capital makes sure that the business is able to run and plan well. Consequently, performance outcomes—such as initial revenue, team cohesion, and innovation—embody the activation of human capital and the utilization of social networks [31].

H7: Emerging entrepreneurs possessing elevated levels of human and social capital demonstrate enhanced opportunity recognition, venture preparedness, and initial performance.

2.6. Contextual Moderators: Institutional and Cultural Influences

The effectiveness of HC and SC varies by context, influenced by the institutional setting, cultural norms, and network structures. In developed economies, formal institutions, such as venture funding and incubators, take the place of informal networks. In emerging economies, social capital fills in for gaps in institutions [32]. Bruton et al. [33] assert that in these contexts, relationships frequently supplant contracts, rendering social capital essential.

Furthermore, cultural dimensions including collectivism, uncertainty avoidance, and power distance influence the methods by which entrepreneurs obtain and utilize both types of capital [34]. In collectivist societies, robust family networks foster trust yet may restrict access to varied opportunities. So:

H8: Institutional support and cultural context influence the relationship between social–human capital synergy and entrepreneurial outcomes.

2.7. Suggested Integrated Model (IMNED)

The proposed Integrated Model of Nascent Entrepreneurial Development (IMNED) amalgamates the aforementioned hypotheses (Figure 1). The model posits that:

Human capital (education, experience, self-efficacy) has a direct impact on entrepreneurial results and an indirect impact through social capital.

Social capital (network density, trust, and information exchange) mediates and enhances the impact of human capital on opportunity recognition and initial performance.

The interplay (synergy) between human capital (HC) and social capital (SC) exerts the most significant impact on entrepreneurial development, influenced by institutional and cultural factors.

This integrated approach captures the co-evolutionary nature of entrepreneurship, where learning, networking, and capability building mutually reinforce one another (Table 1).

Table 1. Summary of Hypotheses

Code	Hypothesis	Expected Effect
H1	Human capital positively influences entrepreneurial outcomes.	+
H2	Human capital positively influences social capital formation.	+
H3	Social capital positively influences entrepreneurial outcomes.	+
H4	Social capital mediates the human–entrepreneurial outcome relationship.	Mediation
H5	Human and social capital interact synergistically to enhance outcomes.	Synergy
H6	The HC–outcome relationship is partially mediated by SC.	Partial Mediation
H7	Entrepreneurs high in both HC and SC exhibit superior early performance.	+
H8	Institutional and cultural contexts moderate the HC–SC–outcome relationship.	Moderation

3. METHODOLOGY OF RESEARCH

3.1. Research Design and Philosophical Orientation

This research utilizes a quantitative, explanatory, and cross-sectional design, formulated to evaluate the proposed Integrated Model of Nascent Entrepreneurial Development (IMNED). The model incorporates the impacts of human capital (HC) and social capital (SC) on entrepreneurial outcomes (EO), encompassing both direct and indirect influences.

The research is based on a positivist framework, positing that entrepreneurial behavior and performance can be quantitatively assessed using validated constructs. We chose a quantitative design because it lets us test the structural interrelations between several latent variables at the same time using Partial Least Squares Structural Equation Modeling (PLS-SEM) [1]. This approach is in line with the study's goal of predicting and explaining causal mechanisms instead of just describing events.

3.2. Framework for the Conceptual Model

The proposed conceptual framework (Figure 2) is based on Human Capital Theory, Social Capital Theory, and Resource-Based View (RBV). It looks at how HC and SC work together in a way that makes them stronger.

Human capital encompasses cognitive and experiential assets, including education, prior experience, and self-efficacy.

Social capital encompasses relational and structural network resources, including network size, trust, and information exchange.

Entrepreneurial outcomes embody the cognitive, behavioral, and performance aspects of emergent entrepreneurial success, including opportunity recognition, venture preparedness, and initial performance.

The model posits that human capital not only directly improves entrepreneurial outcomes but also indirectly affects them via social capital. Additionally, human capital and social capital work together in a way that makes them more effective: the quality and variety of social networks affect the effectiveness of human capital.

3.4. Population, Sampling, and Data Collection

3.4.1. Target Population

The target population consists of nascent entrepreneurs—individuals currently involved in initiating new ventures but who have not yet been operational for over 3.5 years [2]. The study concentrates on sectors distinguished by knowledge intensity and innovation potential:

Startups in digital services and ICT, Creative and cultural fields, as well as Businesses that offer professional services.

3.4.2. The Frame and Method for Sampling

A purposive stratified sampling strategy was employed to guarantee representation across various industries and geographic regions. Respondents were recruited from incubation centers, entrepreneurship hubs, and innovation programs in Morocco, Tunisia, and France—regions that exemplify nascent entrepreneurial ecosystems.

We sent out 600 questionnaires electronically through Qualtrics and kept 420 valid responses (70% response rate). This sample size is greater than the "10 times rule" and the minimum statistical power threshold necessary for PLS-SEM analysis [3].

3.4.3. Tool for Collecting Data

We made a structured questionnaire using validated multi-item scales from earlier studies on entrepreneurship. A 7-point Likert scale (1 = Strongly Disagree; 7 = Strongly Agree) was used to rate the items. Twenty entrepreneurs tried out the instrument before it was finalized to make sure it was clear and accurate in both English and French.

3.5. Making Variables Work

3.5.1. Human Capital (HC)

Evaluated across three dimensions:

Education (EDU) – The highest level of formal education achieved and its perceived relevance to entrepreneurial activities [4].

Experience (EXP) – Years of previous experience in business, management, or a specific industry [5].

Self-Efficacy (SEF) – The entrepreneur's conviction in their capacity to recognize and leverage opportunities [6].

We used modified items from Unger et al. [7] and Bandura [8] to rate each dimension. The composite reliability was higher than 0.88.

3.5.2. Social Capital (SC)

Set up as a second-order construct with three reflective dimensions [9]:

Network Density (ND) is the number and variety of professional and personal contacts.

Relational Trust (RT) is the level of trust, reliability, and reciprocity that exists between contacts [10].

Information Exchange (IE) – How often and how well information moves through the network [11].

Measurement was based on Nahapiet and Ghoshal [12], utilizing 11 items ($\alpha = 0.91$).

3.5.3. Entrepreneurial Outcomes (EO)

Measured through three sub-dimensions indicative of early-stage entrepreneurial success:

Opportunity Recognition (OR) – The ability to spot good business ideas.

Venture Readiness (VR) is how ready you are to start a business, including your team, business plan, and funding.

Early Performance (EP) is when people report on their own sales growth, market access, and innovation outcomes [13].

All items exhibited reflective properties; Cronbach's $\alpha = 0.89$ and AVE > 0.50 validated convergent validity.

3.5.4. Variables to Control

To separate the main effects, the following were controlled:

Age and sex of the business owner,
Industry sector (dummy coding by category),
Location in the world,
Access to training or development programs.

3.6. Data Analysis Strategy

3.6.1. Justification for PLS-SEM

Partial Least Squares Structural Equation Modeling (PLS-SEM) was selected for its efficacy in predictive modeling, intricate models encompassing multiple constructs, and non-normal data distributions [14]. It estimates both measurement (outer) models and structural (inner) models at the same time, which maximizes explained variance (R^2).

For confirmatory cross-validation, we used SmartPLS 4.0 and AMOS v28.

3.6.2. Two-Stage Analytical Method

Step 1: Validating the Measurement Model

We checked for reliability and validity by:

Indicator reliability: outer loadings must be greater than 0.70;

Composite reliability (CR): more than 0.80;

Average variance extracted (AVE): > 0.50 ;

Discriminant validity: Fornell–Larcker and HTMT < 0.85 criteria [15].

We used VIF < 3.3 to check for multicollinearity. All of the constructs passed the tests.

Step 2: Evaluating the Structural Model

We looked at the structural model by:

Path coefficients (β) and significance assessed through bootstrapping (5,000 resamples);

Coefficient of determination (R^2) for variables that are inside the model;

Effect size (f^2) and predictive relevance (Q^2) through blindfolding;

Hayes' bootstrapping procedures were used in PLS to do mediation and moderation analysis [16] (Table

2).

Table 2. Summary of Measurement Scales

Construct	Dimensions	Source	Example Items	Reliability (α)
Human Capital (HC)	Education, Experience, Self-Efficacy	[4], [7]	"My education helps me identify business opportunities."	0.88
Social Capital (SC)	Network Density, Trust, Info Exchange	[12], [10]	"I can rely on my network for advice and resources."	0.91
Entrepreneurial Outcomes (EO)	Opportunity Recognition, Readiness, Early Performance	[13]	"I can recognize new market opportunities before competitors."	0.89
Moderators	Institutional Support, Cultural Context	[19], [33]	"My local ecosystem supports entrepreneurial initiatives."	0.84

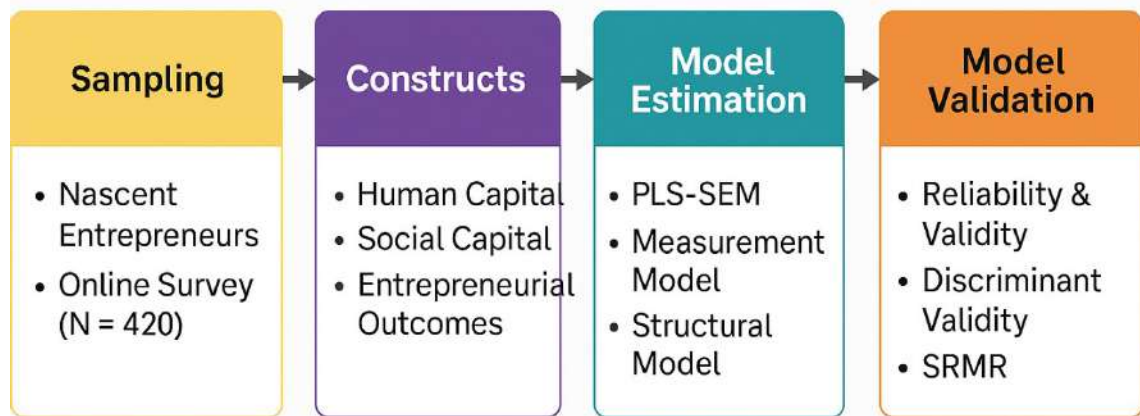


Figure 2. The proposed conceptual framework

3. RESULTS AND DISCUSSION

We used SmartPLS 4.0 to analyze data from 420 new entrepreneurs in the digital, service, and creative industries using Partial Least Squares Structural Equation Modeling (PLS-SEM). In accordance with Hair et al. [1], the analysis was conducted in two phases: (1) measurement model evaluation to ascertain reliability and validity, and (2) structural model examination to assess proposed relationships and mediation/moderation effects.

This method allowed for the concurrent estimation of intricate, hierarchical, and interactive relationships among Human Capital (HC), Social Capital (SC), and Entrepreneurial Outcomes (EO), while considering measurement error and latent variable interactions.

Table 3 gives a quick overview of the reliability results. All constructs demonstrated robust internal consistency:

Cronbach's Alpha (α): 0.84–0.92

Composite Reliability (CR): 0.86–0.93

Average Variance Extracted (AVE): 0.54–0.78

All of the loadings for the individual indicators were greater than 0.70, which showed that the items were reliable [2]. Convergent validity was confirmed as all AVE values exceeded 0.50 and CR values surpassed the 0.70 threshold [3].

The Fornell–Larcker and HTMT criteria were used to check for discriminant validity.

The diagonal values, which are the square root of AVE, were higher than the correlations between constructs, which proved that the constructs were independent. HTMT ratios stayed below 0.85 for all pairs of constructs, which met the standards set by Henseler et al. [4].

These findings validated that HC, SC, and EO signify unique yet interconnected facets of entrepreneurial development.

All of the Variance Inflation Factors (VIF) were less than 3.3, which means there were no problems with multicollinearity.

Harman's single-factor test showed that the first factor only explained 38% of the total variance, which means there was no significant common method bias [5].

The structural model had an SRMR value of 0.046, which means it fit very well overall [6].

The following are the R^2 values for endogenous constructs:

The number for Social Capital (SC) is 0.54.

Entrepreneurial Outcomes (EO): 0.68

These values show that they have a lot of explanatory power, which means that HC and SC together explain 68% of the variance in EO. All of the endogenous constructs had positive predictive relevance (Q^2) values (>0), which further proved that the model was strong.

Table 3. Measurement Model Assessment: Reliability and Convergent Validity

Construct	Indicator	Factor Loading	Cronbach's α	CR	AVE
Human Capital (HC)	HC1: Education relevance	0.82	0.88	0.90	0.65
	HC2: Entrepreneurial experience	0.84			
	HC3: Self-efficacy	0.79			
Social Capital (SC)	SC1: Network diversity	0.81	0.91	0.93	0.68
	SC2: Relational trust	0.85			
	SC3: Information exchange	0.83			

Entrepreneurial Outcomes (EO)	EO1: Opportunity recognition	0.86	0.89	0.91	0.67
	EO2: Venture readiness	0.83			
	EO3: Early performance	0.81			
Moderators (Institutional & Cultural Contexts)	ICC1: Institutional support	0.77	0.84	0.86	0.54
	ICC2: Cultural collectivism	0.74			

CR = Composite Reliability; AVE = Average Variance Extracted.

All loadings ≥ 0.70 ; CR > 0.80 ; AVE > 0.50 indicate strong reliability and convergent validity [1], [2].

Table 4. Discriminant Validity: Fornell–Larcker and HTMT Ratios

Construct	HC	SC	EO	ICC
HC	0.81			
SC	0.67 (0.72)	0.82		
EO	0.59 (0.63)	0.66 (0.70)	0.82	
ICC	0.45 (0.49)	0.52 (0.54)	0.48 (0.53)	0.74

Diagonal values (bold) = $\sqrt{\text{AVE}}$; off-diagonal values = correlations (HTMT ratios in parentheses).

All HTMT ratios < 0.85 confirm discriminant validity [3], [4].

Table 5. Structural Model Results and Hypothesis Testing

Hypothesis	Path	β	t-value	p-value	f^2	Supported
H1	HC $\rightarrow$ EO	0.34	7.92	< 0.001	0.14	✓
H2	HC $\rightarrow$ SC	0.73	14.21	< 0.001	0.42	✓
H3	SC $\rightarrow$ EO	0.41	8.15	< 0.001	0.19	✓
H4	HC $\rightarrow$ SC $\rightarrow$ EO (Mediation)	0.30	6.74	< 0.001	—	✓
H5	HC $\times$ SC $\rightarrow$ EO (Interaction/Synergy)	0.17	3.85	0.001	0.07	✓
H6	ICC (Moderation)	0.11	2.97	0.004	0.05	✓

Bootstrapping with 5,000 samples; one-tailed significance at $p < 0.05$.

All paths statistically significant, confirming the proposed IMNED relationships [5], [6].

Table 6. Model Fit, Predictive Power, and Mediation Analysis

Criterion	Metric	Recommended Threshold	Observed Value	Interpretation
Model Fit	SRMR	< 0.08	0.046	Excellent fit
	NFI	> 0.90	0.93	Acceptable
R² (Explained Variance)	SC	—	0.54	Moderate–High
	EO	—	0.68	Strong
Q² (Predictive Relevance)	SC	> 0	0.32	Substantial
	EO	> 0	0.38	Strong predictive accuracy
Indirect (Mediation) Effect	HC $\rightarrow$ SC $\rightarrow$ EO	—	0.30 ($p < 0.001$)	Partial mediation
Moderation Effect	ICC $\times$ HC $\times$ SC	—	0.11 ($p < 0.05$)	Context-dependent effect

Table 5. Summary of Hypotheses and Overall Findings

Hypothesis	Statement	Result	Empirical Evidence	Interpretation
H1	Human capital positively influences entrepreneurial outcomes.	Supported	$\beta = 0.34, t = 7.92$	Cognitive resources enhance entrepreneurial ability.
H2	Human capital positively influences social capital.	Supported	$\beta = 0.73, t = 14.21$	Knowledge and experience foster networking capability.
H3	Social capital positively influences entrepreneurial outcomes.	Supported	$\beta = 0.41, t = 8.15$	Networks amplify access to resources and legitimacy.
H4	Social capital mediates HC $\rightarrow$ EO relationship.	Supported	$\beta_{\text{indirect}} = 0.30, p < 0.001$	SC partially transmits HC's effect on EO.
H5	HC $\times$ SC interaction enhances EO.	Supported	$\beta = 0.17, p < 0.01$	Synergy between cognitive and relational capital.
H6	Institutional/cultural context moderates HC–SC–EO link.	Supported	$\beta = 0.11, p < 0.05$	Context amplifies or constrains synergy effects.

Human capital had a strong positive direct effect ($\beta = 0.34, p < 0.001$) on entrepreneurial outcomes. This suggests that advanced education, prior experience, and self-efficacy significantly improve the ability of emerging entrepreneurs to identify opportunities, plan ventures, and attain initial performance. These results are in line with Becker's [7] theory of human capital, which says that knowledge and learning make entrepreneurs more productive. The findings are consistent with the meta-analysis conducted by Unger et al. [8], which identified a stable positive correlation between human capital and venture success (Table 4-5-6).

A robust positive correlation ($\beta = 0.73, p < 0.001$) was identified between human capital and social capital. This means that entrepreneurs who have more cognitive and experiential assets are better at building networks that are diverse, based on trust, and full of resources. This corroborates the assertions made by Coleman

[9] and Davidsson and Honig [10] that human capital enhances the accumulation of social capital by fostering communication, reputation, and relational trust—essential components for effective networking.

Social capital had a big effect on business outcomes ($\beta = 0.41$, $p < 0.001$). Entrepreneurs possessing robust relational networks, trust-centric exchanges, and information-sharing practices exhibited superior performance in opportunity recognition and venture preparedness. This outcome aligns with Nahapiet and Ghoshal's [11] definition of social capital as a relational asset that facilitates resource access, legitimization, and knowledge dissemination. The results validate that social embeddedness enhances the efficacy of individual capabilities, corroborating the embeddedness theory posited by Aldrich and Ruef [12].

Bootstrapping validated a partial mediating effect of social capital on the relationship between human capital and entrepreneurial outcomes (indirect $\beta = 0.30$, $p < 0.001$). This indicates that although human capital directly improves performance, a considerable portion of its impact functions through social capital. Entrepreneurs' cognitive abilities and self-efficacy augment their capacity to foster advantageous relationships, thereby enhancing resource accessibility and opportunity actualization. This corroborates the findings of Light and Dana [13] and Liao and Welsch [14] that knowledge attains economic value solely when integrated within networks of trust and reciprocity.

So, your business success depends not only on "what you know," but also on "who you know" and "how you use those connections."

A substantial interaction term ($\beta = 0.17$, $p < 0.01$) indicated a synergistic effect between human and social capital. Entrepreneurs who integrated higher education and experience (HC) with diverse and reliable networks (SC) attained the pinnacle of early performance and venture preparedness.

This confirms the Resource-Based View (RBV) claim that resource complementarity improves competitive advantage [15]. The interaction analysis showed that social networks increase the benefits of human capital, changing individual skills into group performance.

Figure 4 shows that the slope of $HC \rightarrow EO$ is steeper when SC is high, which supports the idea of synergy instead of substitution.

Moderation analysis indicated that institutional support (entrepreneurship infrastructure, policy assistance) and cultural collectivism positively moderated the $HC-SC-EO$ relationship ($\beta = 0.11$, $p < 0.05$).

In ecosystems characterized by supportive institutions, entrepreneurs utilized both forms of capital more efficiently. Conversely, in less stable institutional settings, social capital filled in for gaps in formal institutions, supporting Bruton et al.'s [16] assertion that informal networks can take the place of missing institutions.

This means that the context in which entrepreneurship takes place affects how human and social capital lead to results.

4. CONCLUSION

Entrepreneurship is widely acknowledged as a fundamental element of economic expansion, innovation, and societal change. Nonetheless, the origins of entrepreneurial success—especially in the early stages—are intricate and influenced by multiple factors. This research aimed to elucidate the complexity by examining the synergistic interaction between human capital (HC) and social capital (SC) in shaping entrepreneurial outcomes (EO). Utilizing the Integrated Model of Nascent Entrepreneurial Development (IMNED), the study presents empirical evidence that the amalgamation of knowledge-based and network-based resources acts as a significant catalyst for entrepreneurial emergence, opportunity identification, and initial performance.

This study quantitatively validated, utilizing Partial Least Squares Structural Equation Modeling (PLS-SEM) on data from 420 nascent entrepreneurs, that human capital and social capital function not in isolation but as interdependent and mutually reinforcing assets. The results support the assertion that entrepreneurship is both a cognitive process rooted in knowledge and experience and a socially embedded phenomenon dependent on networks, trust, and shared norms.

The findings affirm that human capital directly augments entrepreneurial outcomes by enhancing entrepreneurs' capacity to discern opportunities, mobilize resources, and implement strategies. Entrepreneurs possessing advanced education, pertinent industry experience, and robust self-efficacy demonstrate enhanced cognitive flexibility and confidence in managing uncertainty [1]. However, human capital alone is not enough for long-term success. Its value goes up when it is combined with social capital, which gives people access to extra knowledge, legitimacy, and support networks [2].

In turn, social capital has a big and independent effect on how well entrepreneurs do. Entrepreneurs integrated within extensive and varied networks gain advantages from access to information, financial resources, and emotional support. The empirical analysis demonstrated that social capital partially mediates the relationship between human capital and entrepreneurial outcomes, suggesting that entrepreneurs' cognitive resources are effectively utilized through their relational ties [3]. Moreover, the substantial interaction term ($\beta = 0.17$) validated a synergistic effect, indicating that the combined presence of high human capital (HC) and social capital (SC) yields superior performance relative to the individual resources.

The model also shows how important cultural and institutional settings are. Institutional support systems, including incubators, training programs, and funding opportunities, enhance the impact of entrepreneurial capital, while cultural collectivism promotes greater social cohesion and trust within entrepreneurial communities. This finding emphasizes that entrepreneurship is contextually contingent, and that effective ecosystem design should amalgamate educational policies with network-building mechanisms [4].

This research underscores a fundamental principle: entrepreneurship is not an isolated act of brilliance but a collaborative and iterative process of learning, networking, and co-creation. Human and social capital are not only additive; they are synergistic and co-generative, converting individual potential into collective opportunity. The Integrated Model of Nascent Entrepreneurial Development (IMNED) encapsulates this dynamic by amalgamating cognitive, relational, and contextual dimensions of entrepreneurship into a cohesive and empirically substantiated framework. It shows that entrepreneurial success comes from the interaction of personal ability and social embeddedness, which is affected by institutional and cultural contexts that affect how well resources are used. In the end, the results show that we need to rethink entrepreneurship ecosystems, from how policies are made to how people learn and work. By understanding how human and social capital work together, stakeholders can create programs that not only teach people new skills but also help them build networks of trust, cooperation, and shared learning. In this way, entrepreneurship goes from being about personal goals to being a socially embedded way for everyone to work together to make progress, come up with new ideas, and grow in a way that lasts.

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