

Est.  
1841

YORK  
ST JOHN  
UNIVERSITY

Aluko, Henry Adeyemi, Watson, Alison, Islam, Nazmul, Fernandes, Fatima Araujo Pereira, Aluko, Akinseye Olatokunbo, Ayertey, Samuel and Baig, Moghal Moheena (2025) Rethinking Business Practices: Harnessing Indigenous Knowledge Systems and Sustainable Strategies for Resilient Entrepreneurial Success. *Business Strategy and the Environment*, 35 (2). pp. 2563-2580.

Downloaded from: <https://ray.yorks.ac.uk/id/eprint/13242/>

The version presented here may differ from the published version or version of record. If you intend to cite from the work you are advised to consult the publisher's version:  
<https://doi.org/10.1002/bse.70306>

Research at York St John (RaY) is an institutional repository. It supports the principles of open access by making the research outputs of the University available in digital form. Copyright of the items stored in RaY reside with the authors and/or other copyright owners. Users may access full text items free of charge, and may download a copy for private study or non-commercial research. For further reuse terms, see licence terms governing individual outputs. [Institutional Repositories Policy Statement](#)

# RaY

Research at the University of York St John

For more information please contact RaY at  
[ray@yorks.ac.uk](mailto:ray@yorks.ac.uk)

## RESEARCH ARTICLE OPEN ACCESS

# Rethinking Business Practices: Harnessing Indigenous Knowledge Systems and Sustainable Strategies for Resilient Entrepreneurial Success

Henry Adeyemi Aluko<sup>1</sup>  | Alison Watson<sup>2</sup>  | Nazmul Islam<sup>2</sup>  | Fatima Araujo Pereira Fernandes<sup>2</sup>  | Akinseye Olatokunbo Aluko<sup>3,4</sup>  | Samuel Ayertey<sup>2</sup>  | Moghal Moheena Baig<sup>2</sup> 

<sup>1</sup>Department of Business Management and Health Studies, York St John University, York, UK | <sup>2</sup>School of Business Management and Creativity, Arden University, Coventry, UK | <sup>3</sup>Oryx Universal University, School of Leadership & Management Practice, Doha, Qatar | <sup>4</sup>Liverpool John Moores University, Liverpool, UK

**Correspondence:** Henry Adeyemi Aluko ([h.aluko@yorksj.ac.uk](mailto:h.aluko@yorksj.ac.uk))

**Received:** 3 June 2025 | **Revised:** 29 September 2025 | **Accepted:** 6 October 2025

**Keywords:** entrepreneurial success | indigenous knowledge systems | resilience | sustainability | sustainable strategies

## ABSTRACT

Entrepreneurship is increasingly reframed beyond profit maximisation toward models that integrate cultural resilience, sustainability and socio-ecological responsibility. This study examines how Indigenous Knowledge Systems (IKS) and Sustainable Strategies (SS) jointly influence entrepreneurial success (ES), addressing a gap where culturally embedded and ecologically responsive practices are rarely considered together. Drawing on the Sustainable Indigenous Entrepreneurship Model (SIEM), ES is conceptualised as a multidimensional construct encompassing growth, innovation, resilience, efficiency and competitiveness. A cross-sectional survey of 124 entrepreneurs across Africa, Asia, Europe and the Americas was analysed using correlation and regression techniques. Results demonstrate that both IKS and SS significantly predict entrepreneurial success, with IKS exerting the stronger influence. Practices such as oral knowledge transmission, traditional work ethics and environmental adaptability emerged as particularly impactful in shaping innovation, efficiency and resilience. These findings affirm the value of hybrid entrepreneurial logics that blend ancestral knowledge with sustainability-oriented strategies. The study contributes theoretically by advancing the indigenisation of entrepreneurship scholarship and empirically validating the integration of cultural and ecological practices. Practically, it offers guidance for policymakers, educators and development actors seeking to promote inclusive, sustainable entrepreneurship. Embedding Indigenous knowledge within sustainability frameworks can enhance resilience and competitiveness while aligning business practices with ecological and cultural integrity.

## 1 | Introduction

The global sustainability agenda, driven by the urgency of climate change, environmental degradation and widening inequality, has catalysed a growing body of research on sustainable entrepreneurship (Kaushik and Dangwal 2024; Perwitasari et al. 2023). On this premise, entrepreneurship is increasingly being redefined beyond the narrow boundaries of market competition and profit maximisation, toward models that prioritise

resilience, sustainability and socio-cultural embeddedness (Diaz 2023; Moya-Clemente et al. 2021). Central to this shift is the recognition of alternative knowledge systems and indigenous epistemologies, particularly Indigenous Knowledge Systems (IKS), which embody localised wisdom, ecological consciousness and intergenerational transfer of skills rooted in cultural values and collective practices (Dei 2000; Magni 2023; Warren 1991). Far from being static relics of the past, IKS are dynamic and context-responsive frameworks that continue

This is an open access article under the terms of the [Creative Commons Attribution](https://creativecommons.org/licenses/by/4.0/) License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

© 2025 The Author(s). *Business Strategy and the Environment* published by ERP Environment and John Wiley & Sons Ltd.

to guide innovation, resource management and sustainable livelihoods across diverse communities (Srikantaiah 2005; Tharakan 2015; Kaniki and Mphahlele 2013).

Sustainable Strategies (SS), often conceptualised through the triple bottom line of economic, environmental and social performance, are now integral to how firms adapt to uncertainty and complexity (Terán-Yépez et al. 2020; Rahman et al. 2024; Ermawati 2024). Entrepreneurs increasingly embed sustainability principles in business models to drive innovation, reduce ecological footprints and strengthen stakeholder relationships (Matzembacher et al. 2019; Rantala et al. 2019). However, the dominant sustainability discourse often privileges Western paradigms, marginalising indigenous and context-specific approaches to environmental and economic resilience (Briggs 2005; Laurie 2005; Chanza and De Wit 2016).

While both IKS and SS have individually attracted scholarly attention, few empirical studies have examined their intersectional influence on entrepreneurial success, particularly in a global context marked by cultural heterogeneity and ecological constraints (Padilla-Meléndez et al. 2022; Bruchac 2020; Miah et al. 2024). Indigenous entrepreneurs often navigate dual worlds, balancing cultural expectations and collective ethics with market-driven imperatives (Foley 2006; Cheteni and Umejesi 2024). This hybrid entrepreneurial logic is not merely a survival tactic but a deliberate strategy to harmonise traditional wisdom with contemporary sustainability demands (Morley 2014; Magni 2023). Research has shown that Indigenous entrepreneurs achieve competitive advantage through local resource utilisation, collaborative decision-making and mission-oriented value systems that emphasise socio-ecological harmony (Lodhi et al. 2012; Colbourne 2023; Ogunu 2015).

At the same time, Sustainable Strategies are associated with enhanced operational efficiency, innovation and long-term planning factors directly linked to business survival and competitiveness (Diaz 2023; Haider et al. 2023; Rajabova et al. 2021). Flexibility in adapting to environmental shifts, efficient use of resources and reduced ecological impact are increasingly recognised as key success factors, particularly in small and medium enterprises operating under resource constraints (Ciocnitu 2024; Hota et al. 2024; Panteleeva 2019). Yet, the full potential of these strategies is likely to be realised only when combined with indigenous cultural knowledge, which provides both a philosophical foundation and a community-based enforcement mechanism for sustainability (Veleva 2020; Gainsford and Evans 2020).

This study responds to the gap in the literature by investigating the combined influence of Indigenous Knowledge Systems and Sustainable Strategies on Entrepreneurial Success. In doing so, it adopts a culturally grounded and ecologically responsive lens to understand how entrepreneurs, particularly those operating across diverse regions, mobilise traditional knowledge and sustainability principles to enhance business performance. Drawing from the Sustainable Indigenous Entrepreneurship Model (SIEM), the study conceptualises entrepreneurial success as a multidimensional construct encompassing growth, resilience, innovation, operational efficiency and market competitiveness (Bruchac 2020; Mugambiwa 2021; Maritz and Foley 2022). The inclusion of demographic factors such as education, location,

experience and revenue offers additional nuance in understanding how contextual variables mediate or amplify the IKS–SS–ES relationship (Azoulay et al. 2018; Grežo 2024; Boso et al. 2018).

The significance of this research lies in its theoretical and practical implications. Theoretically, it contributes to the indigenisation of entrepreneurship research, challenging dominant paradigms and advancing inclusive models of knowledge integration (Durie 2005; Kaya 2004; Briggs and Sharp 2004). Practically, the findings aim to inform educational institutions, development practitioners and policymakers on how to support culturally and environmentally anchored entrepreneurship, particularly in underserved regions. The insights can support policy reforms, curriculum design and funding mechanisms that acknowledge the strategic value of indigenous knowledge in fostering sustainability and competitiveness.

This paper proceeds as follows: Section 2 reviews the literature on Indigenous Knowledge Systems, Sustainable Strategies and Entrepreneurial Success, establishing the conceptual and theoretical foundations of the study. Section 3 outlines the research methodology, including research design, sampling, instrumentation and data analysis procedures. Section 4 presents the results of the statistical analyses, while Section 5 interprets these findings in light of existing theory and empirical work. Section 6 concludes with key implications, limitations and directions for future research. To achieve these objectives, the study adopted a quantitative cross-sectional design, using a structured survey distributed digitally across entrepreneurial networks. The final sample consisted of 124 entrepreneurs from diverse regions including Africa, Asia, Europe and the Americas, allowing for a cross-cultural examination of Indigenous knowledge and sustainability practices. Data were analysed using descriptive statistics, correlation and multiple regression techniques to assess the predictive strength of IKS and SS on entrepreneurial success. This methodological approach ensured both analytical depth and geographical breadth, aligning with the study's goal of capturing culturally embedded entrepreneurial logics in a global context.

## 2 | Literature Review

### 2.1 | Indigenous Knowledge Systems

Indigenous Knowledge Systems (IKS) are not static traditions but living epistemologies that underpin adaptive entrepreneurship, especially in resource-constrained or culturally complex settings. Defined by collective memory, oral transmission and ecological ethics, IKS foster entrepreneurial models rooted in communal value and environmental stewardship (Dei 2000; Magni 2023). Unlike Western paradigms that prioritise individual gain, Indigenous entrepreneurship frequently emphasises relational success and cultural continuity (Mrabure 2019). IKS contribute to innovation and resilience through intergenerational knowledge transfer and context-specific problem-solving, particularly in agriculture, health and artisanal production (Warren 1991; Tharakan 2015). These practices mirror what Schaltegger and Wagner (2011) describe as sustainability innovation—adaptive systems that produce both ecological and social value. Oral traditions function as vehicles for innovation

diffusion, equipping entrepreneurs with long-term memory and community-grounded legitimacy (Srikantaiah 2005; Kaniki and Mphahlele 2013).

Yet the integration of IKS into modern economic frameworks is challenged by epistemic marginalisation and legal exclusion (Briggs 2005). Without protective mechanisms, including sui generis intellectual property systems (Rao 2006), Indigenous entrepreneurs face risks of appropriation and structural exclusion (Cheteni and Umejisi 2024). Still, many navigate hybrid identities, balancing traditional ethics with competitive strategies (Foley 2006), which aligns with Hockerts and Wüstenhagen's (2010) 'emerging Davids' model, where smaller, agile enterprises drive sustainable disruption against institutional inertia.

Moreover, the coevolution of IKS with external knowledge systems reinforces what Stead and Stead (2013) theorise as sustainable strategic coevolution: dynamic adaptations between cultural knowledge and environmental complexity. This theoretical alignment positions IKS not only as a knowledge base but as a strategic asset in sustainability-driven enterprise. Nonetheless, further interdisciplinary inquiry is needed to consolidate IKS within formal entrepreneurial research and policy design (Padilla-Meléndez et al. 2022).

**Proposition 1.** *Entrepreneurs who integrate Indigenous Knowledge Systems (such as oral transmission, community-based collaboration and traditional ethics) will report higher levels of innovation, adaptability and long-term business resilience.*

## 2.2 | Sustainable Strategies in Entrepreneurship

Sustainability strategies in entrepreneurship are increasingly recognised not as optional add-ons but as core elements of business resilience and competitive advantage. These strategies encompass long-term environmental planning, social inclusion and economic adaptability, which collectively contribute to what Dyllick and Hockerts (2002) define as 'beyond business case' sustainability. Rather than focusing solely on compliance or corporate responsibility, entrepreneurs are embedding sustainability into their operating logic to cultivate differentiation, stakeholder trust and innovation potential. This integrative approach aligns closely with what Larson (2000) frames as sustainable innovation—where entrepreneurs act as institutional entrepreneurs who reorganise value chains around ecological principles. In contexts marked by uncertainty, resource scarcity or shifting policy regimes, such strategies enhance organisational agility. For example, flexibility in resource use, investment in energy efficiency and long-term ecological planning contribute to resilience and market positioning, especially among small and medium enterprises (Diaz 2023; Haider et al. 2023).

The strategic pursuit of environmental adaptability reflects what Stead and Stead (2013) described as institutionalising environmental performance. These practices move sustainability beyond symbolic gestures and into the core architecture of entrepreneurial action. Particularly in settings where formal

support structures are weak, entrepreneurs develop sustainability competencies by drawing from community knowledge, circular economy logic and adaptive experimentation (Terán-Yépez et al. 2020; Matzembacher et al. 2019). This supports Schaltegger and Wagner's (2011) argument that sustainability innovation is not the preserve of incumbents but emerges robustly among new entrants with clear ecological missions. While sustainable entrepreneurship often overlaps with corporate social responsibility, its entrepreneurial variant is more proactive and design-oriented, aiming to resolve system failures rather than mitigate reputational risk (Woolthuis 2010; Choi and Gray 2008). The emphasis on mission-driven value creation is particularly evident in family businesses and grassroots ventures that prioritise long-term ecological and social outcomes over short-term profit maximisation (Oguonu 2015; Pascucci et al. 2022). So, it can be drawn that sustainable strategies empower entrepreneurs to operate under volatility while enhancing systemic impact. When viewed through the lens of Stead and Stead's (2013) evolutionary model, these strategies represent not isolated practices but expressions of adaptive coevolution, where sustainability principles are iteratively shaped by environmental, cultural and institutional dynamics.

**Proposition 2.** *Entrepreneurs who adopt Sustainable Strategies (such as environmental adaptability, resource efficiency and long-term planning) are more likely to achieve operational efficiency and market competitiveness.*

## 2.3 | Entrepreneurial Success

Entrepreneurial success extends beyond financial gain to encompass resilience, innovation, operational efficiency and long-term market relevance. In sustainability-oriented ventures, success is increasingly measured by the ability to respond to environmental and social complexity while maintaining strategic coherence. This multidimensional framing resonates with what Schaltegger and Wagner (2011) conceptualise as sustainability innovation: the fusion of economic performance with systemic transformation. Empirical studies affirm that adaptability is critical for entrepreneurial survival in uncertain environments. Haider et al. (2023) found that enterprises with flexible operations and sustainability competencies navigated the COVID-19 crisis more effectively. This supports the argument advanced by Stead and Stead (2013) that sustainable success depends on the coevolution of environmental foresight and strategic decision-making.

IKS-informed practices such as oral knowledge transmission and community-based collaboration contributed meaningfully to product and process innovation. This aligns with Larson's (2000) view of entrepreneurs as agents of sustainable change who generate value through novel configurations of knowledge and ecological insight. Such innovation is not merely technical but rooted in context—shaped by localised understandings of resilience, resource use and community engagement. Operational efficiency also remains a core dimension. Entrepreneurs who integrate sustainability into their business logic often achieve cost savings through energy conservation, waste minimization and lean resource planning (Diaz 2023). These operational gains translate into competitiveness, particularly when paired with ethical branding

and stakeholder trust. Dyllick and Hockerts (2002) emphasise that such integration elevates sustainability from peripheral responsibility to strategic imperative.

Cultural integration further amplifies market positioning. Entrepreneurs who blend traditional ethics with sustainable strategy often cultivate niche markets, especially in cultural tourism and artisanal sectors (Cheteni and Umejesei 2024). Hockerts and Wüstenhagen (2010) contend that these ‘emerging Davids’ can outperform incumbents by capitalizing on authenticity, agility and ecological legitimacy. The convergence of cultural rootedness with environmental orientation offers a durable competitive advantage, particularly in saturated or unstable markets. In sum, entrepreneurial success is neither unilinear nor purely financial. It emerges through dynamic capabilities, context-sensitive innovation and ecological embeddedness—dimensions increasingly central to both Indigenous and sustainability-led enterprises.

**Proposition 3.** *Entrepreneurial success is a multidimensional construct comprising growth, innovation, operational efficiency, resilience and competitiveness, and is influenced by both Indigenous knowledge and sustainability strategy.*

## 2.4 | Moderating Variables in Entrepreneurial Success

The impact of Indigenous Knowledge Systems and sustainable strategies on entrepreneurial success is shaped by contextual variables that either amplify or constrain strategic outcomes. Among these, experience, education, region, revenue and location emerge as significant moderators that influence how entrepreneurs translate cultural knowledge and sustainability orientation into viable business models.

Entrepreneurial experience contributes to strategic foresight and adaptive learning. Entrepreneurs with longer operational histories are more likely to navigate uncertainty through refined decision-making and iterative experimentation (Boso et al. 2018; Vaillant and Lafuente 2019). This aligns with Stead and Stead’s (2013) co-evolutionary perspective, which views entrepreneurial resilience as an emergent capability shaped by ongoing feedback between environmental change and strategic response.

Education likewise plays a catalytic role in shaping entrepreneurial cognition. Formal education fosters critical thinking and interdisciplinary reasoning, enabling entrepreneurs to merge Indigenous epistemologies with modern business strategy (Slater and Park 2023; Manafe et al. 2023). Educational attainment not only improves planning and financial management but also enhances the capacity to adopt environmentally responsible practices. This reflects Schaltegger and Wagner’s (2011) emphasis on sustainability-oriented entrepreneurs as learning agents who continuously adapt their models to reflect ecological and institutional realities.

Geographic region and business location affect access to infrastructure, financial capital and market networks. Entrepreneurs in urban areas often benefit from stronger institutional ecosystems, while those in rural or peri-urban settings may rely more heavily on IKS and local networks for market survival

(Cheteni and Umejesei 2024; Gielnik et al. 2018). Hockerts and Wüstenhagen’s (2010) model supports this differentiation by showing how ‘emerging Davids’ succeed through niche specialisation and resourcefulness, particularly in underserved regions.

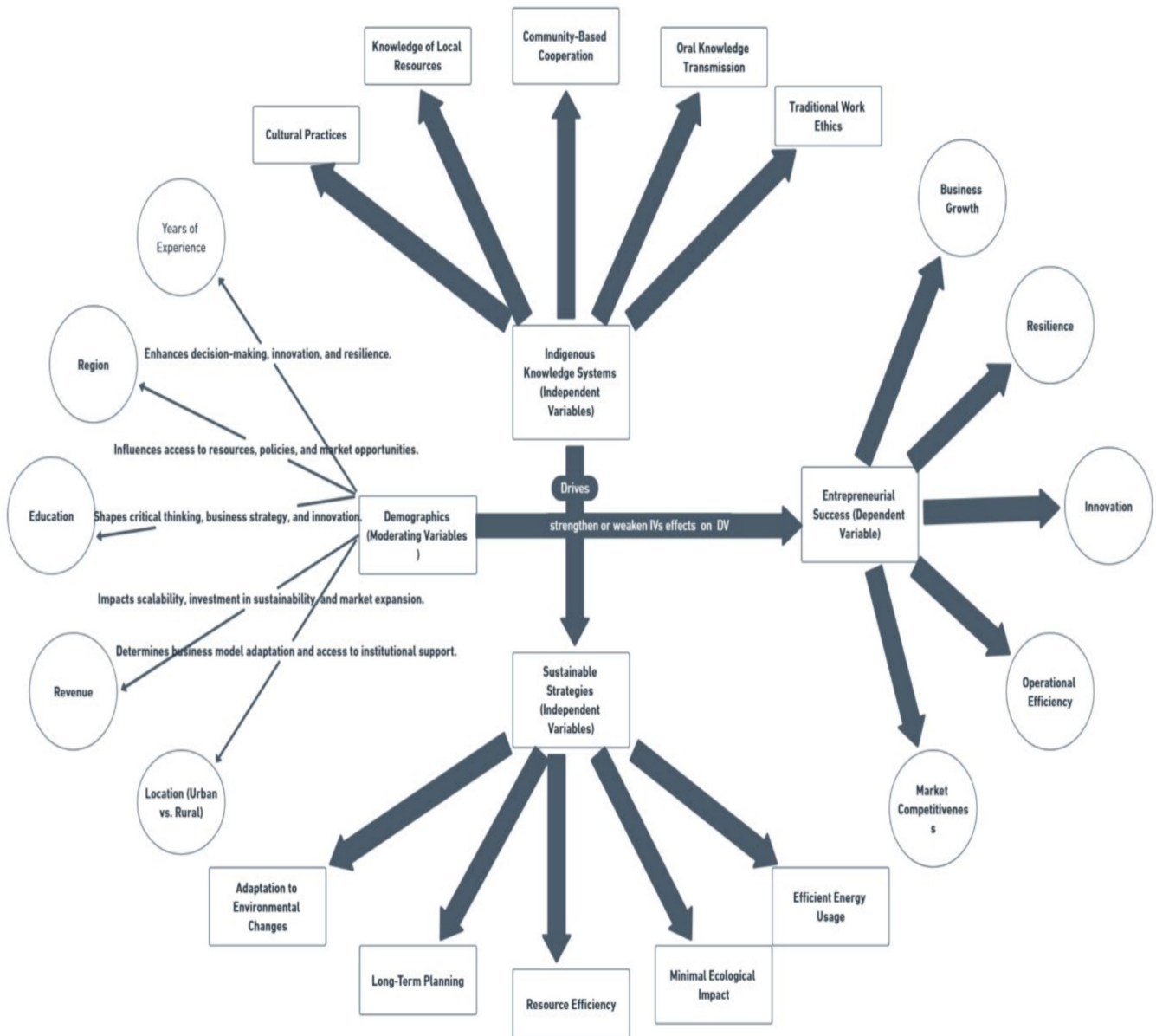
Revenue functions both as an outcome and a moderator. Higher-revenue firms typically possess greater capacity to invest in sustainability innovations and formalise Indigenous knowledge practices (Rajabova et al. 2021). The entrepreneurial process is not context-neutral. The effectiveness of IKS and sustainability strategies is mediated by a constellation of demographic, institutional and geographic variables that shape the trajectory and durability of business success. These findings affirm the need for nuanced, context-sensitive models of entrepreneurship.

**Proposition 4.** *The strength of the relationship between IKS and SS on Entrepreneurial Success is moderated by key demographic variables, such that the effects are more pronounced for entrepreneurs with greater experience, higher education, urban location or higher revenue levels.*

The SIEM in Figure 1 above conceptualises entrepreneurial success as the product of interaction between Indigenous Knowledge Systems (IKS), Sustainable Strategies (SS) and contextual variables. IKS (rooted in ecological wisdom, cultural values and community-based ethics) provides a foundation for resilience, innovation and locally appropriate solutions (Bruchac 2020; Foley 2006). SS, in turn, supports long-term adaptability, resource efficiency and competitiveness in uncertain environments (Terán-Yépez et al. 2020; Kaushik and Dangwal 2024). SIEM posits that the integration of IKS and SS is mediated by experience, education, region, revenue and location. Experienced entrepreneurs tend to better navigate complexity, drawing from both Indigenous knowledge and sustainability competencies (Boso et al. 2018). Formal education enhances strategic planning and critical reasoning, which support the blending of ancestral knowledge with contemporary practices (Vasquez-Peñañiel and Perello-Marín 2021). Location and revenue further shape entrepreneurs’ ability to scale innovations and access institutional support (Armatas et al. 2016; Rajabova et al. 2021).

IKS contributes to entrepreneurial outcomes by promoting culturally informed decision-making, intergenerational knowledge transfer and the strategic use of local resources (Cheteni and Umejesei 2024; Morley 2014). These features parallel what Stead and Stead (2013) describe as coevolutionary strategy—an iterative alignment between internal capabilities and external ecological systems. Oral traditions, collaborative work ethics and collective responsibility enhance social capital and business resilience (Gainsford and Evans 2020). SS further supports business performance by enabling long-term planning, energy efficiency and eco-innovation. Entrepreneurs who internalise sustainability principles often outperform competitors on both financial and reputational metrics (Dyllick and Hockerts 2002; Diaz 2023). These strategies resonate with broader sustainability innovation frameworks, where environmental responsiveness is tightly linked to competitiveness and stakeholder engagement (Schaltegger and Wagner 2011).

Within SIEM, entrepreneurial success is multidimensional—reflected in growth, operational efficiency, innovation and market



**FIGURE 1** | Sustainable Indigenous Entrepreneurship Model (SIEM). *Source:* Authors (2025).

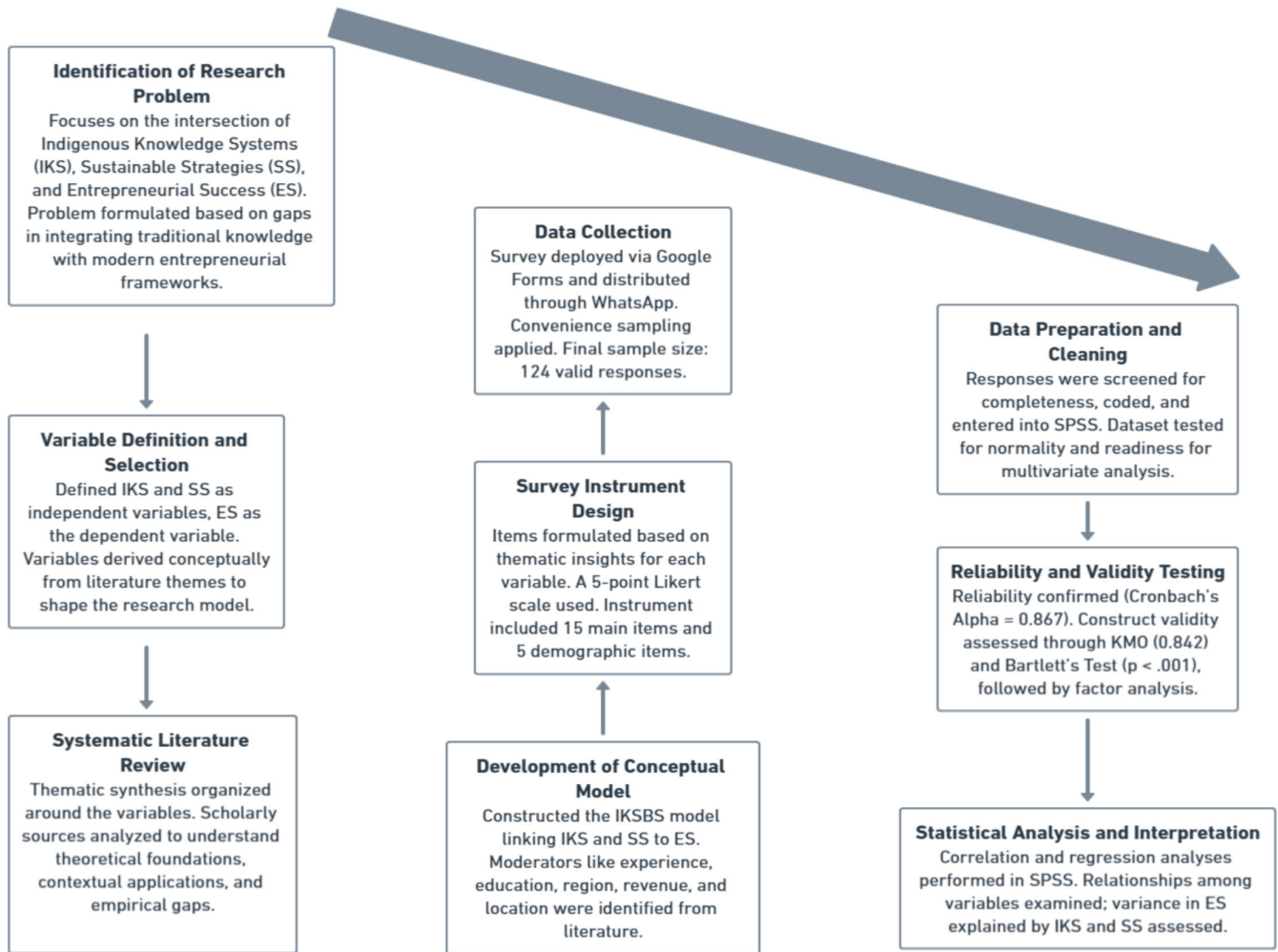
relevance. Entrepreneurs who blend traditional knowledge with sustainability principles are better equipped to navigate market volatility and environmental risk, especially when contextual factors are favourable (Haider et al. 2023; Mugambiwa 2021). Eventually, SIEM positions Indigenous and sustainable practices not as alternatives to modern entrepreneurship but as synergistic assets for inclusive, adaptive and ecologically responsible business success.

### 3 | Research Methodology

#### 3.1 | Research Design

This study adopted a quantitative cross-sectional survey design to investigate the influence of Indigenous Knowledge Systems

(IKS) and Sustainable Strategies (SS) on Entrepreneurial Success (ES). The choice of a quantitative approach was informed by the need to objectively measure and statistically analyse the relationships among the identified constructs across a diverse respondent base. A cross-sectional design enabled the collection of data at a single point in time, offering a snapshot of the prevailing practices and perceptions among entrepreneurs operating in varied socio-cultural and economic environments. This design is appropriate for hypothesis testing and facilitates generalisation within the context of the sample (Creswell 2014). Furthermore, the model guiding the study, the Sustainable Indigenous Entrepreneurship Model (SIEM), necessitated a data-driven approach that could empirically validate the relationships between independent and dependent variables. Figure 2 illustrates the research procedure.



**FIGURE 2** | The research procedure summary. *Source:* Authors (2025).

### 3.2 | Population and Sampling

The target population for this study comprised entrepreneurs actively engaged in ventures that incorporate Indigenous Knowledge Systems (IKS) and/or Sustainable Strategies (SS) into their business models. Participants were required to meet at least one of the following inclusion criteria: (a) self-identification as an entrepreneur or small business operator, (b) use of traditional or community-based knowledge in business decision-making or (c) incorporation of sustainability principles in operations, products or services. To access this diverse group efficiently, the study adopted convenience sampling. While nonprobabilistic, this method was appropriate given the global scope, exploratory nature of the research and the practical challenge of reaching entrepreneurs working in culturally embedded and often marginalised domains. Recruitment was conducted through digital snowballing on professional and entrepreneurial WhatsApp groups, social media networks and community business forums. Participants were drawn from over 12 countries across Africa, Asia, Europe, North America and South America, with the highest representation from Europe (35.5%), Asia (32.3%) and Africa (23.4%).

The final dataset included 124 complete responses. This sample size met the minimum statistical power requirements for multivariate analysis and exceeded Hair et al.'s (2010) recommendation of at least 10 respondents per variable. Demographic diversity was also achieved in terms of years of experience, education levels, business location (urban, suburban, rural) and revenue scale, variables that were later analysed as potential moderators. Although not generalisable in a strict statistical sense, the sample is analytically robust and reflects a wide spectrum of entrepreneurial contexts where IKS and SS are relevant. Replicability is also feasible through the same digital recruitment channels and eligibility criteria. This sampling approach allowed the researchers to explore cross-cultural and multi-sectoral perspectives that would be difficult to capture using a narrow, randomised sample.

### 3.3 | Data Collection Procedure

Data were gathered through a structured online questionnaire developed via Google Forms, which was chosen for its accessibility, cost-effectiveness and compatibility with mobile devices.

The link to the survey was shared across social media platforms, particularly WhatsApp groups associated with entrepreneurial networks and professional forums. This digital approach facilitated access to a diverse and geographically distributed population, including respondents from Africa, Asia, Europe and other regions.

Participation in the survey was entirely voluntary, and informed consent was explicitly obtained at the beginning of the questionnaire. Participants were assured of the confidentiality and anonymity of their responses, and no personally identifiable information was collected. Instructions were clearly stated, and respondents were allowed to withdraw at any stage without penalty. The structure of the survey and its deployment were designed to uphold ethical research standards while ensuring ease of participation and high response rates.

### 3.4 | Survey Instrument

The development of the survey instrument was grounded in the conceptual framework of the study, the Sustainable Indigenous Entrepreneurship Model (SIEM). This model identified two independent variables and one dependent variable, each operationalised through five items measured on a five-point Likert scale ranging from *Strongly Disagree* to *Strongly Agree*. The independent variables were Indigenous Knowledge Systems (IKS) and Sustainable Strategies (SS), while the dependent variable was Entrepreneurial Success (ES).

Items under IKS focused on the entrepreneur's use of local resources, traditional decision-making practices, community-based collaboration, oral knowledge transmission and work ethics rooted in Indigenous culture. Sustainable Strategies were assessed through items relating to resource efficiency, environmental adaptability, long-term planning, minimising ecological impact and energy conservation. Entrepreneurial Success was measured across dimensions such as business growth, resilience, innovation, operational efficiency and market competitiveness. The structured nature of the instrument enabled the quantification of attitudes and practices, providing a consistent framework for comparative analysis across respondents.

### 3.5 | Validity and Reliability

The instrument's psychometric robustness was assessed through reliability and factor analysis procedures. Reliability was evaluated using Cronbach's Alpha, which yielded a value of 0.867 for the overall scale. This score reflects high internal consistency, indicating that the items within each construct were coherent and measured the same underlying dimensions. To assess construct validity, the data were subjected to Exploratory Factor Analysis (EFA) using Principal Component Analysis with Oblimin rotation. The Kaiser-Meyer-Olkin (KMO) measure was 0.842, surpassing the threshold of 0.8, and Bartlett's Test of Sphericity was significant at  $p < 0.001$ , confirming the suitability of the dataset for factor analysis. The factor solution yielded distinct but interrelated components, as evidenced by

the Component Correlation Matrix, which revealed moderate correlations among extracted factors. These outcomes confirmed that the constructs of IKS, SS and ES were both theoretically and statistically justified, providing a robust foundation for subsequent analyses.

### 3.6 | Data Analysis Techniques

The data collected through the survey instrument were first cleaned and coded, then subjected to statistical analysis using IBM SPSS Statistics Version 27. Descriptive statistics, including means and standard deviations, were calculated to summarise the central tendencies of responses across variables. To examine the relationships between the independent variables, Indigenous Knowledge Systems and Sustainable Strategies and the dependent variable, Entrepreneurial Success, Pearson correlation analysis was applied. This method was selected for its suitability in assessing linear associations between continuous variables.

In addition, multiple linear regression analysis was conducted to determine the predictive power of the independent variables on Entrepreneurial Success. This regression model facilitated an understanding of how much variance in entrepreneurial outcomes could be attributed to indigenous and sustainability-driven business strategies. The analysis included checks for statistical significance, model fit and the strength of individual predictors, ensuring the robustness and validity of the findings.

### 3.7 | Ethical Considerations

The research adhered strictly to ethical standards applicable to social science research involving human participants. Prior to participating in the study, all respondents were presented with an informed consent statement embedded in the introduction to the online questionnaire. This statement clarified the voluntary nature of participation, assured respondents of their anonymity and emphasised the confidentiality of all data collected. No personally identifiable information was requested or recorded, and participants retained the right to exit the survey at any point without providing justification. The researchers ensured that all data were stored securely and used solely for academic purposes. The ethical approach employed in this study safeguarded participant rights and fostered an environment of trust and transparency throughout the research process.

## 4 | Results

### 4.1 | Descriptive Statistics

The final dataset comprised responses from 124 participants who completed the survey instrument in full. This sample offered broad geographic and demographic representation, enabling meaningful statistical interpretation of Indigenous Knowledge Systems (IKS), Sustainable Strategies (SS) and Entrepreneurial Success (ES).

**TABLE 1** | Demographic data summary.

<b>Demographic characteristics of respondents</b>			
<b>Category</b>	<b>Subcategory</b>	<b>Count (N=124)</b>	<b>Percentage (%)</b>
Years of business Experience	Less than 1 year	23	18.55
	1–3 years	28	22.58
	4–6 years	22	17.74
	7–10 years	15	12.10
	Over 10 years	36	29.03
Region	Africa	29	23.39
	Asia	40	32.26
	Australia/Oceania	1	0.81
	Europe	44	35.48
	North America	8	6.45
	South America	2	1.61
Location	Urban	94	75.81
	Suburban	16	12.90
	Rural	14	11.29
Highest level of education	No formal education	4	3.23
	Primary education	4	3.23
	Secondary education	20	16.13
	Higher education (certificate, diploma, bachelor's)	67	54.03
	Postgraduate education (master's, Ph.D.)	29	23.39
Revenue (monthly)	Less than \$50	5	4.03
	\$51–\$100	9	7.26
	\$101–\$150	9	7.26
	\$151–\$200	13	10.48
	\$201–\$250	11	8.87
	\$251–\$300	7	5.65
	\$300 and above	70	56.45

*Note:* This table presents the demographic characteristics of the participants, including business experience, geographic region, location type, education level and monthly revenue distribution.

*Source:* SPSS v27.

#### 4.1.1 | Demographics

The demographic characteristics of the respondents reflect diversity in business experience, education, revenue generation and geographical location. See Table 1 for details on demographic characteristics.

The demographic data provides a comprehensive view of the survey respondents, offering insights into their business experience, geographic distribution, education levels and financial performance. The years of business experience among respondents vary, with the largest group (29.03%) having more than 10 years in business, followed by those with one to 3 years (22.58%) and four to 6 years (17.74%). A smaller proportion

has seven to 10 years (12.10%), while the least experienced group, with less than 1 year, accounts for 18.55%. This distribution indicates that the survey captures insights from a mix of highly experienced entrepreneurs as well as those who are relatively new to business. In terms of geographic representation, respondents are primarily from Europe (35.48%) and Asia (32.26%), collectively making up more than two-thirds of the sample. Africa follows at 23.39%, while North America (6.45%) and South America (1.61%) have smaller representations. Australia/Oceania has the least representation, accounting for only 0.81% of the respondents. This suggests that the study has a strong focus on European and Asian business environments, with relatively fewer insights from the Americas and Oceania.

The location distribution of businesses indicates that an overwhelming majority (75.81%) operate in urban areas, reflecting a trend where businesses are more concentrated in cities, likely due to better access to markets, infrastructure and resources. Suburban businesses account for 12.90%, while rural businesses represent 11.29%, suggesting that businesses based on Indigenous Knowledge Systems and sustainable strategies might be less common in rural settings or that rural entrepreneurs have lower participation in such surveys. The education levels of respondents show a high concentration of individuals with formal education. More than half (54.03%) hold higher education qualifications such as certificates, diplomas or bachelor's degrees, while a significant portion (23.39%) has postgraduate education, including master's and Ph.D. degrees. Secondary education holders make up 16.13%, whereas a very small proportion of respondents have only primary education (3.23%) or no formal education at all (3.23%). This high level of education among respondents suggests that businesses leveraging Indigenous Knowledge Systems and sustainability principles might be operated by individuals with formal training, possibly integrating traditional knowledge with modern business strategies.

The monthly revenue distribution reveals significant income disparities among respondents. The majority (56.45%) report earning \$300 and above per month, indicating a group of businesses with stable financial performance. The second-largest category is those earning between \$151 and \$200 per month (10.48%), followed by \$201–\$250 (8.87%) and \$101–\$150 (7.26%). Only a small percentage of businesses report earning less than \$50 per month (4.03%), while those in the \$51–\$100 range represent 7.26%. Businesses in the \$251–\$300 range account for 5.65%. These figures suggest that while a significant proportion of businesses are financially successful, there is still a considerable number operating at low revenue levels, potentially indicating varying stages of business growth or differences in economic conditions across regions.

The demographic data presents a diverse sample of entrepreneurs with varying business experience, strong urban representation, a high level of education and a broad range of financial performance. The prevalence of highly educated respondents operating in urban settings and generating higher revenues suggests that businesses using Indigenous Knowledge Systems and sustainability strategies may be well integrated with modern business practices. However, the presence of respondents with lower education levels and lower revenues indicates that traditional knowledge-based businesses may also be operated by small-scale entrepreneurs in different economic conditions. Table 2 illustrates the descriptive statistics of the demographics.

The Table 2 summarises descriptive statistics for key demographic and business-related variables, highlighting respondent characteristics such as business experience, location, education and revenue. On average, respondents have 3.10 years of business experience (SD = 1.502), indicating moderate variability. The region variable (M = 3.51) suggests a diverse geographical distribution. Location (M = 1.35, SD = 0.677) shows low variability, implying concentration in a specific area. The average education level (M = 3.91)

**TABLE 2** | Demographic statistics of the demographics.

Descriptive data summary		
Variable	Mean	Std. deviation
Years of business experience	3.10	1.502
Region	3.51	1.723
Location	1.35	0.677
Highest level of education	3.91	0.902
Revenue (monthly)	5.56	1.931
Valid N (listwise)	124	—

*Note:* This table presents the descriptive statistics, including mean values and standard deviations, for key demographic variables in the study sample.  
*Source:* SPSS v27.

indicates higher educational attainment, while monthly revenue (M = 5.56, SD = 1.931) reflects substantial earnings variation. A valid N of 124 confirms complete responses, ensuring data reliability.

#### 4.1.2 | Descriptive Statistics for IKS, SS and ES

The Table 3 below summarises descriptive statistics for three key variables: Indigenous Knowledge Systems (IKS), Sustainable Strategies (SS) and Entrepreneurial Success (ES), highlighting their role in business performance. It presents the mean scores, standard deviations and the valid response count (N = 124). For IKS, which includes knowledge of local resources, cultural practices and work ethics, mean scores range from 4.06 to 4.39, with the highest for local resource knowledge (4.39) and the lowest for community-based collaboration (4.06). These results indicate a generally positive perception of IKS in business, with moderate response variation (SD = 0.606–0.857).

SS focuses on resource efficiency, environmental adaptation and long-term planning, with mean scores between 3.95 and 4.42. The highest values are for flexibility in adapting to changes (4.42) and long-term planning (4.42), while minimising ecological impact scores the lowest (3.95). Responses show a strong sustainability orientation with low variability. ES, the dependent variable, assesses growth, resilience, innovation, efficiency and market competitiveness, with mean scores from 4.01 to 4.22. The highest (4.22) reflects competitiveness, while the lowest (4.01) relates to operational efficiency. Moderate standard deviations suggest consistency in responses. In all, respondents view IKS and SS as valuable for business success, with high mean values indicating strong agreement and some variation in sustainability and knowledge application. The complete dataset (N = 124) ensures reliable analysis.

#### 4.2 | Reliability and Validity of the Instrument

To ensure the internal consistency and construct validity of the survey instrument, several psychometric evaluations were conducted. Reliability was first assessed using Cronbach's Alpha, a

**TABLE 3** | Descriptive statistics of IKS, SS and ES.

<b>Descriptive statistics of IKS, SS and ES</b>		
<b>Variable</b>	<b>Mean</b>	<b>Std. deviation</b>
Section B: indigenous knowledge systems (IV1)		
Knowledge of local resources	4.39	0.608
Problem-solving and decision-making influenced by indigenous cultural practices	4.22	0.606
Collaboration rooted in traditional community values	4.06	0.849
Oral knowledge transmission as a business resource	4.10	0.731
Indigenous work ethics and business success	4.11	0.857
Section C: sustainable strategies (IV2)		
Efficient use of resources	4.35	0.677
Flexibility in adapting to environmental changes	4.42	0.688
Long-term planning for resource management	4.42	0.700
Minimising ecological impact in business operations	3.95	0.900
Efficient energy usage for reducing operational costs	4.17	0.843
Section D: entrepreneurial success (DV)		
Business growth over time	4.02	0.727
Adaptation to challenges using indigenous knowledge and sustainable strategies	4.14	0.800
Innovation in products or processes	4.11	0.701
Operational efficiency through indigenous and sustainable strategies	4.01	0.738
Market competitiveness using indigenous and sustainable strategies	4.22	0.669
Valid N (listwise)	124	—

Note: This table presents descriptive statistics for Indigenous Knowledge Systems (IV1), Sustainable Strategies (IV2) and Entrepreneurial Success (DV), including means and standard deviations for each measured variable.  
Source: SPSS v27.

**TABLE 4** | Reliability statistics of IKS, SS and ES.

<b>Reliability statistics of IKS, SS and ES</b>	
<b>Cronbach's Alpha</b>	<b>N of items</b>
0.867	15

Source: SPSS v27.

statistical measure of internal consistency. The overall reliability coefficient for the 15 Likert-scale items spanning the constructs of Indigenous Knowledge Systems (IKS), Sustainable Strategies (SS) and Entrepreneurial Success (ES) was  $\alpha=0.867$ , as shown in Table 4 below. This value exceeds the commonly accepted threshold of 0.70, indicating a high degree of reliability and coherence among the items in measuring their respective constructs.

To further validate the instrument's dimensional structure, Exploratory Factor Analysis (EFA) was conducted using Principal Component Analysis (PCA) with Oblimin rotation. Preliminary testing confirmed that the data were suitable for factor analysis. As shown in Table 5 below, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.842, well above the minimum threshold of 0.60, demonstrating that the sample was sufficient to yield reliable factor solutions. In parallel, Bartlett's

**TABLE 5** | KMO and Bartlett's test of IKS, SS and ES.

<b>Kaiser-Meyer-Olkin and Bartlett's test of sphericity</b>		
Kaiser-Meyer-Olkin measure of sampling adequacy	0.842	
Bartlett's test of sphericity	Approx. chi-square	605.610
	df	105
	Sig.	<0.001

Note: A KMO value above 0.80 indicates meritorious sampling adequacy (Kaiser, 1974), and the significant Bartlett's Test ( $p < 0.001$ ) supports the factorability of the correlation matrix.  
Source: SPSS v27.

Test of Sphericity was statistically significant ( $p < 0.001$ ), confirming the presence of adequate correlations among variables to justify the application of factor analysis.

The factor analysis extracted multiple components corresponding to the predefined constructs. While distinct factors emerged, the Component Correlation Matrix in Table 6 below revealed both positive and negative correlations among components,

ranging from 0.333 to 0.303. These interrelationships validate the use of Oblimin rotation, which allows for the expected theoretical overlap between constructs such as IKS and SS, and their combined influence on Entrepreneurial Success. Each item demonstrated substantial loading on its respective factor, providing empirical support for the construct validity of the measurement model.

To sum it up, the reliability and factor structure of the survey instrument were statistically sound. The results confirm that the instrument appropriately captured the core dimensions of the conceptual model and was suitable for subsequent correlation and regression analyses.

**TABLE 6** | Component correlation matrix.

Component correlation matrix				
Component	1	2	3	4
1	1.000	0.157	-0.298	0.303
2	0.157	1.000	-0.302	0.237
3	-0.298	-0.302	1.000	-0.333
4	0.303	0.237	-0.333	1.000

Note: Extraction method: principal component analysis. Rotation method: oblimin with Kaiser normalisation.  
Source: SPSS v27.

### 4.3 | Correlation Analysis

#### 4.3.1 | Correlation Analysis of Indigenous Knowledge Systems and Entrepreneurial Success

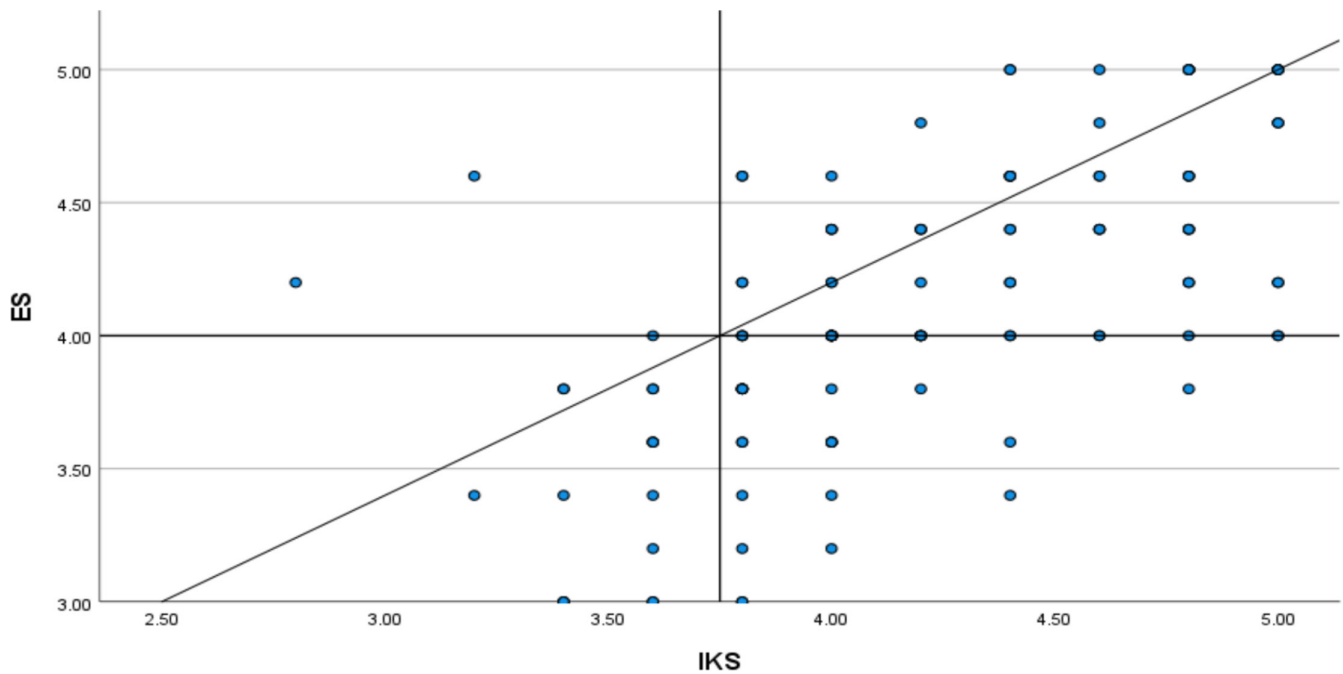
The following table presents the Pearson correlation coefficients between various aspects of Indigenous Knowledge Systems (IKS) and Entrepreneurial Success (ES) metrics. The correlations indicate the strength and direction of relationships between the independent and dependent variables.

The correlation analysis in Table 7 above suggests that Indigenous Knowledge Systems (IKS) significantly enhance entrepreneurial success, particularly in innovation, efficiency and competitiveness. Key findings include strong positive correlations between community-based collaboration (IKS 3) and business growth (ES 11) (0.380,  $p < 0.01$ ), as well as between oral knowledge transmission (IKS 4) and innovation (ES 13) (0.453,  $p < 0.01$ ), suggesting that traditional knowledge-sharing fosters creativity. Work ethics (IKS 5) also correlate positively with efficiency (ES 14) (0.423,  $p < 0.01$ ) and competitiveness (ES 15) (0.283,  $p < 0.01$ ), emphasising their role in long-term business success. Furthermore, adaptation and resilience (ES 12) show strong correlations with innovation (ES 13) (0.538,  $p < 0.01$ ) and business growth (ES 11) (0.568,  $p < 0.01$ ), highlighting the importance of indigenous knowledge-based problem-solving. Knowledge of local resources (IKS 1) and problem-solving skills (IKS 2) also contribute significantly to entrepreneurial growth, efficiency and market positioning. In all, the findings demonstrate that integrating Indigenous Knowledge

**TABLE 7** | Correlation matrix showing relationships among IKS and entrepreneurial success variables.

Correlation matrix showing relationships among IKS and entrepreneurial success variables										
Variable	1	2	3	4	5	6	7	8	9	10
1. IKS 1–Knowledge of local resources	1									
2. IKS 2–Problem-solving and decision-making	0.454**	1								
3. IKS 3–Community-based collaboration	0.336**	0.403**	1							
4. IKS 4–Oral knowledge transmission	0.329**	0.352**	0.371**	1						
5. IKS 5–Traditional work ethics	0.150	0.203*	0.304**	0.318**	1					
6. ES 11–Business growth	0.365**	0.136	0.380**	0.286**	0.335**	1				
7. ES 12–Adaptability through IKS	0.325**	0.223*	0.420**	0.198*	0.274**	0.568**	1			
8. ES 13–Innovation through IKS	0.412**	0.382**	0.358**	0.453**	0.344**	0.458**	0.538**	1		
9. ES 14–Operational efficiency	0.265**	0.269**	0.259**	0.466**	0.423**	0.257**	0.287**	0.438**	1	
10. ES 15–Market competitiveness	0.211*	0.203*	0.293**	0.418**	0.283**	0.390**	0.415**	0.484**	0.375**	1

Note: IKS = Indigenous Knowledge Systems; ES = Entrepreneurial Success.  $p < 0.05$  (significant at the 5% level).  $p < 0.01$  (significant at the 1% level).  
Source: SPSS v27.



**FIGURE 3** | Scatter plot of ES by IKS. *Source:* SPSS v27.

Systems strengthens business resilience, innovation and sustainability, making them valuable assets in entrepreneurship.

This scatter plot in Figure 3 above illustrates the relationship between Individual Knowledge Sharing (IKS) on the x-axis and Entrepreneurial Success (ES) on the y-axis. The data points show a generally positive correlation, as indicated by the upward-sloping trendline, suggesting that higher levels of individual knowledge sharing are associated with greater entrepreneurial success. Additionally, two intersecting lines divide the chart into quadrants, which may be used to categorise different levels of IKS and ES. While the overall pattern supports the idea that sharing knowledge can contribute to business success, the dispersion of points also highlights variability, implying that other factors may influence this relationship.

Table 8 above presents correlations between Sustainable Strategies (SS) and Entrepreneurial Success (ES) metrics, illustrating how sustainability initiatives impact business outcomes. Pearson's correlation coefficient ( $r$ ) measures these relationships, where values closer to  $\pm 1$  indicate stronger correlations. Significant relationships are marked at  $p < 0.01$  (strong) and  $p < 0.05$  (moderate). Efficient resource use (SS6) positively correlates with operational efficiency (ES14) and innovation (ES13), indicating that resource optimisation enhances innovation and performance. Adaptability (SS7) strongly correlates with market competitiveness (ES15) and innovation (ES13), suggesting that flexible businesses are more competitive. Long-term sustainability planning (SS8) aligns with business growth (ES11) and operational efficiency (ES14). While minimising ecological impact (SS9) improves market competitiveness (ES15) and efficiency (ES14). Energy efficiency (SS10) correlates with business growth (ES11) and innovation (ES13), emphasising financial and operational benefits. Sustainable strategies contribute significantly to growth, innovation and competitiveness, reinforcing the

importance of resource efficiency, long-term planning and energy conservation in achieving business success.

This scatter plot in Figure 4 above displays the relationship between Sustainable Strategies (SS) and Entrepreneurial Success (ES), where SS is represented on the x-axis and ES on the y-axis. The distribution of data points suggests a positive correlation, with higher levels of Sustainable Strategies generally corresponding to higher entrepreneurial success. A trendline is included, indicating an upward trajectory, reinforcing the idea that as Sustainable Strategies increases, there is a tendency for entrepreneurial success to improve. However, some data points deviate from the trend, suggesting variability in the relationship. The chart highlights the importance of Sustainable Strategies in fostering entrepreneurial achievements while acknowledging that other factors may also influence success.

#### 4.4 | Regression Analysis

##### 4.4.1 | Predicting Entrepreneurial Success (ES) From Indigenous Knowledge Systems (IKS) and Sustainable Strategies (SS)

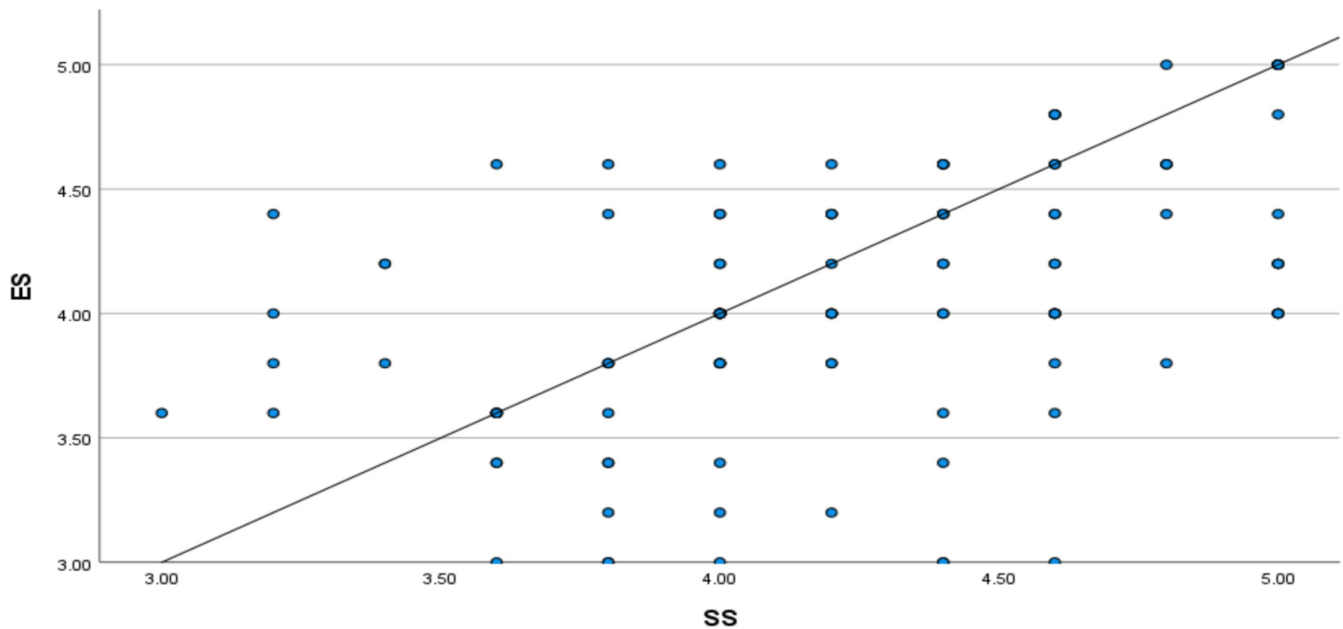
A multiple regression analysis was conducted to examine the predictive power of Indigenous Knowledge Systems (IKS) and Sustainable Strategies (SS) on Entrepreneurial Success (ES).

A multiple linear regression analysis (see Table 9) was conducted to assess the combined and individual effects of Indigenous Knowledge Systems (IKS) and Sustainable Strategies (SS) on Entrepreneurial Success (ES). The model produced a statistically significant fit,  $F(2, 121) = 49.93$ ,  $p < 0.001$  and explained approximately 45.2% of the variance in entrepreneurial success ( $R^2 = 0.452$ ; adjusted  $R^2 = 0.443$ ). The standard error of

**TABLE 8** | Correlation matrix of sustainable strategies (SS) and entrepreneurial success (ES) variables.

Correlation matrix of sustainable strategies (SS) and entrepreneurial success (ES) variables										
Variable	1	2	3	4	5	6	7	8	9	10
1. SS 6–Efficient use of resources	1									
2. SS 7–Flexibility in adapting to changes	0.359**	1								
3. SS 8–Long-term planning for sustainability	0.250**	0.409**	1							
4. SS 9–Minimising ecological impact	0.295**	0.256**	0.420**	1						
5. SS 10–Efficient energy usage	0.335**	0.311**	0.209*	0.236**	1					
6. ES 11–Business growth	0.247**	0.175	0.156	0.263**	0.166	1				
7. ES 12–Adaptation using IKS	0.255**	0.220*	0.158	0.133	0.351**	0.568**	1			
8. ES 13–Innovation using IKS	0.292**	0.458**	0.350**	0.357**	0.229*	0.458**	0.538**	1		
9. ES 14–Operational efficiency	0.238**	0.266**	0.261**	0.380**	0.155	0.257**	0.287**	0.438**	1	
10. ES 15–Market competitiveness	0.295**	0.400**	0.324**	0.341**	0.237**	0.390**	0.415**	0.484**	0.375**	1

Note: SS = Sustainable Strategies; ES = Entrepreneurial Success.  $p < 0.05$  (2-tailed).  $p < 0.01$  (2-tailed). Source: SPSS v27.



**FIGURE 4** | Scatter plot of ES by SS. Source: SPSS v27.

the estimate (1.99) indicates acceptable dispersion of residuals around the predicted values.

Both predictors (IKS and SS) made statistically significant contributions to the model. Indigenous Knowledge Systems

demonstrated the strongest effect, with a standardised beta coefficient ( $\beta$ ) of 0.513,  $t = 5.89$ ,  $p < 0.001$ . The unstandardised coefficient ( $B = 0.554$ ) suggests that for every one-unit increase in IKS, entrepreneurial success increases by approximately 0.55 units, holding SS constant. This underscores the substantial role of

**TABLE 9** | Multiple regression results for predicting entrepreneurial success from IKS and SS.

Predictor	<i>B</i>	SE	$\beta$	<i>t</i>	<i>p</i>
(Constant)	4.077	1.680	—	2.427	0.017
Indigenous knowledge systems (IKS)	0.554	0.094	0.513	5.889	<0.001
Sustainable strategies (SS)	0.228	0.091	0.218	2.501	0.014
<i>R</i>	<i>R</i> <sup>2</sup>	Adjusted <i>R</i> <sup>2</sup>	Std. error of estimate		
0.672	0.452	0.443	1.988		
Source	SS	df	MS	<i>F</i>	<i>p</i>
Regression	394.737	2	197.369	49.934	<0.001
Residual	478.263	121	3.953		
Total	873.000	123			

Note: *N* = 124. Dependent variable: Entrepreneurial Success (ES). Predictors: Indigenous Knowledge Systems (IKS), Sustainable Strategies (SS). Abbreviations: *B* = unstandardised coefficient; SE = standard error;  $\beta$  = standardised coefficient. Source: SPSS v27.

traditional knowledge, oral transmission and community-based collaboration in shaping innovation, operational efficiency and market resilience.

Sustainable Strategies also contributed significantly, albeit to a lesser extent ( $\beta = 0.218$ ,  $t = 2.50$ ,  $p = 0.014$ ). The unstandardised coefficient for SST ( $B = 0.228$ ) implies that each one-unit increase in sustainability practice (such as long-term planning, resource efficiency or environmental adaptability) is associated with a 0.23-unit increase in entrepreneurial success, controlling for IKS. This finding affirms the value of ecological foresight and strategic adaptability in business growth, consistent with prior literature on eco-enterprise strategy (Stead and Stead 2013; Dyllick and Hockerts 2002).

The regression model as a whole reflects a strong empirical endorsement of the SIEM. It confirms that both cultural knowledge systems and sustainability strategies are significant predictors of entrepreneurial performance, with IKS exerting a particularly robust influence. These results validate the theoretical proposition that hybrid logics (where ancestral knowledge and sustainability co-evolve) can drive business innovation, resilience and competitiveness across diverse entrepreneurial contexts.

#### 4.5 | Summary of Key Findings

The analysis confirmed that both Indigenous Knowledge Systems (IKS) and Sustainable Strategies (SS) significantly predict Entrepreneurial Success (ES), with IKS exerting a stronger influence ( $\beta = 0.513$ ,  $p < 0.001$ ) than SS ( $\beta = 0.218$ ,  $p = 0.014$ ). IKS elements such as oral knowledge transmission and community-based collaboration correlated strongly with innovation ( $r = 0.453$ ) and business growth ( $r = 0.380$ ), highlighting the value of intergenerational learning and collective ethics in driving adaptability and resilience.

SS practices also contributed meaningfully, particularly environmental adaptability ( $r = 0.458$ ) and long-term planning

( $r = 0.324$ ), though their overall predictive power was more moderate. Innovation emerged as a central outcome influenced by both cultural and ecological strategies, while market competitiveness was shaped by the combined effect of Indigenous collaboration and sustainable efficiency.

Weaker correlations were observed for IKS-based problem-solving and ecological impact minimisation, suggesting that while valued, these dimensions may play a less direct role in short-term entrepreneurial gains. Overall, the model explained 45.2% of the variance in ES ( $R^2 = 0.452$ ), validating the combined importance of cultural knowledge and sustainability in shaping resilient business outcomes. The findings highlight a layered dynamic where tradition and strategy intersect to influence growth and competitiveness.

## 5 | Discussion

This study provides empirical support for the SIEM, affirming that Indigenous Knowledge Systems (IKS) and Sustainable Strategies (SS) significantly predict Entrepreneurial Success (ES). Beyond confirming statistical associations, the findings illuminate how culturally grounded knowledge systems and sustainability practices function not as parallel tools but as interdependent, synergistic mechanisms that shape innovation, resilience and competitive advantage in entrepreneurial ventures. This offers new insight into how entrepreneurship may be reconceptualised in diverse contexts that do not conform to Western-centric logics of market performance. The regression analysis revealed that IKS was the stronger predictor of ES, a finding that challenges conventional assumptions about the superiority of formal business tools and modern management techniques. Oral knowledge transmission and community-based collaboration were especially influential, both positively correlated with innovation and business growth. These results echo and empirically extend prior work that frames Indigenous entrepreneurship as a form of collective agency embedded in place, history and social networks (Foley 2006; Bruchac 2020). The strength of IKS in this context affirms that cultural memory,

social capital and intergenerational knowledge are not peripheral but central to adaptive entrepreneurial behaviour.

This also confirms and expands on Gainsford and Evans (2020), who argue that Indigenous pedagogies (particularly oral, experiential and relational learning) can foster strategic foresight and enterprise sustainability. The effectiveness of these knowledge systems in promoting business success illustrates what Schaltegger and Wagner (2011) describe as sustainability-oriented innovation emerging from distributed, noninstitutionalised sources. In this light, your findings illustrate that Indigenous approaches do not simply complement sustainability—they constitute it through alternative frameworks of responsibility, value and time. Equally important, the data show that Sustainable Strategies also positively impact ES, particularly through flexibility in responding to environmental change and long-term planning. These dimensions of SS align with core tenets of sustainable entrepreneurship theory, which highlights strategic adaptability as key to innovation and long-term viability (Terán-Yépez et al. 2020; Haider et al. 2023). Entrepreneurs who incorporated SS reported better operational efficiency and market competitiveness, reinforcing Stead and Stead's (2013) co-evolutionary model: businesses thrive when strategic planning evolves in concert with environmental dynamics.

However, the influence of SS was comparatively weaker than IKS. This finding may reflect the reality that while sustainability principles are increasingly mainstream, they often lack the embeddedness and normative force that Indigenous epistemologies carry within specific communities. The weaker performance of ecological impact minimisation as a predictor of ES supports this view. It suggests that while entrepreneurs may value environmental responsibility in principle, their actual business behaviours are shaped more by immediate economic constraints, particularly in emerging or resource-constrained contexts (Rajabova et al. 2021; Diaz 2023). Thus, SS (especially when externally imposed or top-down) may not translate as readily into measurable business benefits as context-driven, culturally internalised practices do.

A nuanced contribution of this study is its empirical validation of the hybrid entrepreneurial logic theorised in your SIEM model. The results suggest that neither IKS nor SS alone is sufficient for sustained entrepreneurial success. Rather, their strategic value is magnified when they operate in tandem. For example, oral knowledge traditions gain new entrepreneurial power when paired with ecological adaptability, just as sustainability practices become more grounded and credible when reinforced by community ethics and local legitimacy. This hybridisation reflects a layered form of entrepreneurial agency—one that merges ancestral wisdom with modern foresight and situational strategy. This insight extends the existing literature on hybrid entrepreneurship (Hockerts and Wüstenhagen 2010; Magni 2023) by offering quantitative evidence that culturally embedded and sustainability-oriented strategies co-produce entrepreneurial success. It also addresses Briggs's (2005) critique that development models often romanticise Indigenous knowledge without embedding it structurally. Here, the findings suggest that IKS becomes most effective not when idealised in isolation but when integrated intentionally with broader sustainability principles and adapted to real market conditions.

Importantly, the study reveals that the influence of both IKS and SS is shaped by contextual factors. The moderating role of experience, education, revenue and location highlights the situatedness of entrepreneurial success. For instance, experienced entrepreneurs were better able to leverage both traditional knowledge and sustainability strategies, possibly due to their deeper institutional knowledge or broader exposure to risk. Similarly, education enhanced the translation of Indigenous knowledge into business frameworks, suggesting that formal and informal learning processes need not be in tension. These dynamics affirm broader scholarship on inclusive entrepreneurship, which emphasises the interplay of individual agency and structural conditions in shaping outcomes (Miah et al. 2024; Kaushik and Dangwal 2024).

This context sensitivity also reflects the value of your globally diverse sample. With respondents from Africa, Asia, Europe and the Americas, the study captures how IKS and SS function across cultural and institutional settings. While generalisability is limited by the sampling method, the diversity of the dataset lends credibility to the argument that Indigenous and sustainability-driven logics are not bound to one region or tradition but have broader applicability in the entrepreneurship ecosystem. From a theoretical standpoint, the study contributes to the indigenisation of entrepreneurship research by showing how culturally grounded knowledge systems can be operationalised and measured alongside formal business strategies. The SIEM model bridges a critical gap in the literature by offering a framework that neither isolates culture from strategy nor treats sustainability as purely technocratic. Instead, it proposes an integrated vision where heritage, ecology and enterprise co-constitute success.

Practically, these insights are highly relevant for development organisations, policy makers and educators. Programs that aim to build entrepreneurial capacity in underserved regions should not treat Indigenous knowledge as an adjunct to be preserved, but as a strategic asset to be leveraged. Embedding sustainability literacy into community-based education or incubator models can enhance innovation, reduce failure rates and promote long-term socio-economic inclusion. This study contributes new knowledge to sustainable and Indigenous entrepreneurship by empirically validating that tradition and strategy are not in conflict, but mutually reinforcing. The SIEM model offers a lens for future research and policy to better integrate cultural legitimacy and ecological intelligence into entrepreneurial design. Through demonstrating how these forces interact dynamically within diverse global contexts, the study advances a more inclusive and environmentally attuned vision of entrepreneurship.

## 6 | Conclusion

This study investigated the influence of Indigenous Knowledge Systems (IKS) and Sustainable Strategies (SS) on Entrepreneurial Success (ES), using a quantitative framework supported by global data and empirical analysis. The findings confirm that both IKS and SS are significant predictors of entrepreneurial performance, with IKS exerting a stronger effect. Elements such as oral knowledge transmission, collective ethics and cultural problem-solving emerged as key drivers of innovation,

operational efficiency and competitiveness. Sustainability practices—particularly environmental adaptability and long-term planning—also contributed meaningfully to success. Rather than acting independently, IKS and SS were shown to function synergistically, offering a hybrid logic of entrepreneurship that is context-responsive, resource-conscious and culturally embedded.

This research offers three core contributions. Theoretically, it advances the indigenisation of entrepreneurship scholarship by integrating IKS into a formal performance model—addressing a gap in current literature where Indigenous knowledge is often excluded or under-theorised. The proposed SIEM contributes a novel conceptual lens that accounts for the interaction between cultural systems, ecological strategy and contextual moderators such as experience and geography. Empirically, the study draws from a globally diverse sample of entrepreneurs, offering rare quantitative insights into how Indigenous and sustainability-based logics operate across urban and rural, high- and low-revenue contexts. The model's statistical robustness ( $R^2=0.452$ ) and the strength of IKS in predicting success offer measurable validation of concepts that have often been treated qualitatively or descriptively.

Practically, the findings provide a roadmap for policy-makers, educators and support organisations seeking to promote inclusive entrepreneurship. Initiatives that embed Indigenous knowledge within sustainability training, especially in developing economies, can unlock new pathways for culturally coherent and ecologically responsible business development. Future research could expand the SIEM model to sector-specific applications or explore how legal and institutional frameworks can better support Indigenous innovation ecosystems. This study elevates Indigenous knowledge from peripheral practice to central entrepreneurial logic, providing empirical evidence and theoretical clarity on its role in building sustainable, resilient and competitive enterprises.

## 6.1 | Further Studies

Despite these contributions, the study is not without limitations. The use of convenience sampling and a digital survey format may have excluded certain segments of the entrepreneurial population, particularly those in rural or digitally disconnected regions. Furthermore, while the study captured a diverse international sample, regional differences were not analysed in depth. These factors limit the generalisability of the findings and point to areas for further inquiry. Future research should consider a comparative analysis across regions or industries to examine how the influence of IKS and SS may vary by context. Qualitative or mixed-methods studies could also provide deeper insights into the lived experiences of Indigenous entrepreneurs and how they navigate the interplay between traditional knowledge and modern business demands. Additionally, investigating the moderating effects of demographic variables such as education, gender and revenue on the IKS–ES relationship could yield more nuanced understandings. In closing, this study underscores the relevance of Indigenous knowledge and sustainability thinking in building entrepreneurial ecosystems that are not only profitable but also equitable and enduring. As

global interest in sustainable development intensifies, there is a growing need to ground entrepreneurship in frameworks that honor both ecological imperatives and cultural wisdom. This research takes a step in that direction by affirming the value of Indigenous and sustainable practices as legitimate, effective and future-forward strategies for entrepreneurial success.

---

## Author Contributions

Conceptualization: Henry Adeyemi Aluko, Alison Watson, MD Nazmul Islam. Methodology: Dr. Henry Adeyemi Aluko, Alison Watson, MD Nazmul Islam. Investigation: Fatima Araujo Pereira Fernandes, Akinseye Olatokunbo Aluko. Data Curation: Fatima Araujo Pereira Fernandes, Akinseye Olatokunbo Aluko, Henry Adeyemi Aluko. Formal Analysis: Henry Adeyemi Aluko, Akinseye Olatokunbo Aluko. Writing – Original Draft: Henry Adeyemi Aluko. Writing – Review and Editing: Alison Watson, MD Nazmul Islam, Henry Adeyemi Aluko, Akinseye Olatokunbo Aluko. Visualization: Samuel Ayertey, Moghal Moheena Baig. Writing – Findings and Discussion: Samuel Ayertey, Moghal Moheena Baig. Writing – Conclusion: Henry Adeyemi Aluko, Akinseye Olatokunbo Aluko. Project Administration: Henry Adeyemi Aluko. Supervision: Prof. Alison Watson. Validation: All authors. Funding Acquisition: Not applicable. Resources: All authors. Proofreading and Final Approval: All authors.

## Conflicts of Interest

The authors declare no conflicts of interest.

## References

- Armatas, C. A., T. J. Venn, B. B. McBride, A. E. Watson, and S. J. Carver. 2016. "Opportunities to Utilize Traditional Phenological Knowledge to Support Adaptive Management of Social-Ecological Systems Vulnerable to Changes in Climate and Fire Regimes." *Ecology and Society* 21, no. 1: 16. <https://doi.org/10.5751/ES-07905-210116>.
- Azoulay, P., B. F. Jones, J. D. Kim, and J. Miranda. 2018. "Age and High-Growth Entrepreneurship." (No. w24489; p. w24489). National Bureau of Economic Research. <https://doi.org/10.3386/w24489>.
- Boso, N., I. Adeleye, F. Donbesuur, and M. Gyensare. 2018. "Do Entrepreneurs Always Benefit From Business Failure Experience?" *Journal of Business Research* 98: 370–379. <https://doi.org/10.1016/j.jbusres.2018.01.063>.
- Briggs, J. 2005. "The Use of Indigenous Knowledge in Development: Problems and Challenges." *Progress in Development Studies* 5, no. 2: 99–114. <https://doi.org/10.1191/1464993405ps105oa>.
- Briggs, J., and J. Sharp. 2004. "Indigenous Knowledges and Development: A Postcolonial Caution." *Third World Quarterly* 25, no. 4: 661–676. <https://doi.org/10.1080/01436590410001678915>.
- Bruchac, M. M. 2020. "Indigenous Knowledge and Traditional Knowledge." In *Encyclopedia of Global Archaeology*, edited by C. Smith, 2nd ed., 3924–3932. Springer. [https://doi.org/10.1007/978-1-4419-0465-2\\_10](https://doi.org/10.1007/978-1-4419-0465-2_10).
- Chanza, N., and A. De Wit. 2016. "Enhancing Climate Governance Through Indigenous Knowledge: Case in Sustainability Science." *South African Journal of Science* 112, no. 3–4: 1–7. <https://doi.org/10.17159/sajs.2016/20140287>.
- Cheteni, P., and I. Umejisi. 2024. "Indigenous Knowledge in Entrepreneurship and Cultural Tourism in the Rural Areas." *Comparative Sociology* 23, no. 4: 56–72. <https://doi.org/10.1163/15691330-bja10110>.
- Choi, D., and E. Gray. 2008. "The Venture Development Processes of "Sustainable" Entrepreneurs." *Management Research News* 31, no. 8: 558–569. <https://doi.org/10.1108/01409170810892127>.

- Ciocnitu, C. R. 2024. "Strategies for Implementing Sustainability in Entrepreneurial Businesses." *Ovidius University Annals, Economic Sciences Series* 23, no. 2: 56–62. <https://doi.org/10.61801/ouaess.2023.2.07>.
- Colbourne, R. 2023. "Contributions of Indigenous Women's Entrepreneurships in Colombia to Their Economy, Territorial Governance, and Climate Resilience During COVID-19." *Rights and Resources Initiative* 11, no. 1: 78–92. <https://doi.org/10.53892/hxla5068>.
- Creswell, J. W. 2014. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. 4th ed. Sage.
- Dei, G. J. S. 2000. "Rethinking the Role of Indigenous Knowledges in the Academy." *International Journal of Inclusive Education* 4, no. 2: 111–132. <https://doi.org/10.1080/136031100284849>.
- Diaz, G. N. C. 2023. "Entrepreneurship and the Different Strategies to Achieve Business Sustainability." *Gestión en el Tercer Milenio* 26, no. 52: 45–63. <https://doi.org/10.15381/gtm.v26i52.27082>.
- Durie, M. 2005. "Indigenous Knowledge Within a Global Knowledge System." *Higher Education Policy* 18, no. 3: 301–312. <https://doi.org/10.1057/palgrave.hep.8300092>.
- Dyllick, T., and K. Hockerts. 2002. "Beyond the Business Case for Corporate Sustainability." *Business Strategy and the Environment* 11, no. 2: 130–141. <https://doi.org/10.1002/bse.323>.
- Ermawati, Y. 2024. "Entrepreneurial Finance Strategies for Startup Success." *Advances in Economics & Financial Studies* 2, no. 2: 45–53. <https://doi.org/10.60079/aefs.v2i2.283>.
- Foley, D. 2006. "Does Business Success Make You Any Less Indigenous?" *Indigenous Law Bulletin* 6, no. 26: 18–20.
- Gainsford, A., and M. Evans. 2020. "Integrating Andragogical Philosophy With Indigenous Teaching and Learning." *Management Learning* 52, no. 4: 559–580. <https://doi.org/10.1177/1350507620972528>.
- Gielnik, M. M., H. Zacher, and M. Wang. 2018. "Age in the Entrepreneurial Process: The Role of Future Time Perspective and Prior Entrepreneurial Experience." *Journal of Applied Psychology* 103, no. 9: 1067–1085. <https://doi.org/10.1037/apl0000322>.
- Grežo, M. 2024. "Entrepreneurial Experience and Venture Success: A Comprehensive Meta-Analysis of Performance Determinants." *Journal of Entrepreneurship, Management and Innovation* 20: 5–29. <https://doi.org/10.7341/20242011>.
- Haider, M., R. Shannon, G. Moschis, and E. Autio. 2023. "How Has the COVID-19 Crisis Transformed Entrepreneurs Into Sustainable Leaders?" *Sustainability* 15, no. 6: 65358. <https://doi.org/10.3390/su15065358>.
- Hair, J. F., W. C. Black, B. J. Babin, and R. E. Anderson. 2010. *Multivariate Data Analysis*. 7th ed. Pearson Prentice Hall.
- Hockerts, K., and R. Wüstenhagen. 2010. "Greening Goliaths Versus Emerging Davids—Theorizing About the Role of Incumbents and New Entrants in Sustainable Entrepreneurship." *Journal of Business Venturing* 25, no. 5: 481–492. <https://doi.org/10.1016/j.jbusvent.2009.07.005>.
- Hota, S., N. Mohanty, A. Kumar, and K. Panda. 2024. "Achieving Sustainability in Newly Founded Start-Up Businesses: Navigating Challenges and Gaining Insights." *Recoletos Multidisciplinary Research Journal* 12, no. 1: 1–12. <https://doi.org/10.32871/rmrj2412.01.01>.
- Kaniki, A., and M. Mphahlele. 2013. "Indigenous Knowledge for the Benefit of All: Can Knowledge Management Principles Be Used Effectively?" *South African Journal of Libraries and Information Science* 68, no. 1: 1–15. <https://doi.org/10.7553/68-1-753>.
- Kaushik, N., and R. Dangwal. 2024. "Sustainable Entrepreneurship: A Systematic Review and Future Research Directions." *Abhigyan* 31, no. 2: 45–62. <https://doi.org/10.1177/09702385241280810>.
- Kaya, H. O. 2004. "Building on the Indigenous: Successes, Challenges, and Future Prospects of the Indigenous Knowledge Systems Learning and Research Programme." *Indilinga: African Journal of Indigenous Knowledge Systems* 3, no. 1: 91–98. <https://doi.org/10.4314/INDILINGA.V3I1.26348>.
- Larson, A. L. 2000. "Sustainable Innovation Through an Entrepreneurship Lens." *Business Strategy and the Environment* 9, no. 5: 304–317. [https://doi.org/10.1002/1099-0836\(200009/10\)9:5<304::AID-BSE255>3.0.CO;2-O](https://doi.org/10.1002/1099-0836(200009/10)9:5<304::AID-BSE255>3.0.CO;2-O).
- Laurie, N. 2005. "Establishing Development Orthodoxy: Negotiating Masculinities in the Water Sector." *Development and Change* 36, no. 3: 527–549. <https://doi.org/10.1111/j.0012-155X.2005.00423.x>.
- Lodhi, S., I. Naseem, and S. Ali. 2012. "Implication of Indigenous Knowledge Management." *Knowledge Management for Development Journal* 8, no. 3: 35–42. <https://doi.org/10.1115/1.859971.paper27>.
- Magni, G. 2023. "Indigenous Knowledge and Implications for the Sustainable Development Agenda." *European Journal of Education* 52, no. 4: 437–447. <https://doi.org/10.1111/EJED.12238>.
- Manafe, M. W. N., M. R. Ohara, S. Gadzali, M. A. K. Harahap, and A. Ausat. 2023. "Exploring the Relationship Between Entrepreneurial Mindsets and Business Success: Implications for Entrepreneurship Education." *Journal on Education* 5, no. 4: 567–578. <https://doi.org/10.31004/joe.v5i4.2238>.
- Maritz, A., and D. Foley. 2022. "Indigenous Entrepreneurship and Venture Creation: A Typology of Indigenous Crowdfunding Campaigns." *Entrepreneurship Theory and Practice* 47, no. 2: 289–312. <https://doi.org/10.1177/10422587221096907>.
- Matzembacher, D., M. Raudsaar, M. D. Barcellos, and T. Mets. 2019. "Sustainable Entrepreneurial Process: From Idea Generation to Impact Measurement." *Sustainability* 11, no. 21: 5892. <https://doi.org/10.3390/su11215892>.
- Miah, M. T., Z. Lakner, and M. Fekete-Farkas. 2024. "Addressing Poverty Through Social Entrepreneurship for Sustainable Development: A Bibliometric Analysis." *Administrative Sciences* 14, no. 1: 16. <https://doi.org/10.3390/admsci14010016>.
- Morley, S. 2014. "Success Factors for Indigenous Entrepreneurs and Community-Based Enterprises." *Entrepreneurship and Regional Development* 26, no. 5–6: 468–492.
- Moya-Clemente, I., G. Ribes-Giner, and J. C. Chaves-Vargas. 2021. "Sustainable Entrepreneurship: An Approach From Bibliometric Analysis." *Journal of Business Economics and Management* 22, no. 2: 297–319. <https://doi.org/10.3846/JBEM.2021.13934>.
- Mrabure, R. O. 2019. "Indigenous Business Success: A Hybrid Perspective." *Journal of Enterprising Communities: People and Places in the Global Economy* 13, no. 3: 275–295. <https://doi.org/10.1108/JEC-10-2018-0076>.
- Mugambiwa, S. 2021. "Integrating Indigenous Knowledge Systems in Entrepreneurship: A Case of Horticulture Farmers in Mutoko District of Zimbabwe." *Indonesian Journal of Social and Environmental Issues* 2, no. 3: 62–69. <https://doi.org/10.47540/ijsei.v2i3.297>.
- Ogonu, C. 2015. "Business Strategies for Effective Entrepreneurship: A Panacea for Sustainable Development and Livelihood in the Family." *International Journal of Management and Sustainability* 4, no. 1: 10–19. <https://doi.org/10.18488/JOURNAL.11/2015.4.1/11.1.10.19>.
- Padilla-Meléndez, A., J. J. Plaza-Angulo, A. R. Del-Águila-Obra, and A. Ciruela-Lorenzo. 2022. "Indigenous Entrepreneurship: Current Issues and Future Research." *Entrepreneurship and Regional Development* 34, no. 1–2: 6–31. <https://doi.org/10.1080/08985626.2021.2011962>.
- Panteleeva, I. 2019. "Variants of Strategic Behavior to Start and Develop an Entrepreneurial Business." *Knowledge International Journal* 31, no. 1: 213–220. <https://doi.org/10.35120/kij3101213p>.

- Pascucci, T., G. M. Cardella, B. Hernández-Sánchez, and J. Sánchez-García. 2022. "Environmental Sensitivity to Form a Sustainable Entrepreneurial Intention." *Sustainability* 14, no. 16: 10398. <https://doi.org/10.3390/su141610398>.
- Perwitasari, D., A. Nurrahmawati, and H. Susanto. 2023. "A Comprehensive Dataset for Bibliometric Analysis of Sustainable Entrepreneurship With an Augmented Bibliometric Approach." *Journal of Theory and Applied Management* 16, no. 2: 109–125. <https://doi.org/10.20473/jmtt.v16i2.45794>.
- Rahman, N. H. A., Z. M. Isa, and A. Anuar. 2024. "Emerging Trends in Sustainable Entrepreneurial Behavior: Bibliometric Data Insights." *Information Management and Business Review* 16, no. 1: 45–67. [https://doi.org/10.22610/imbr.v16i1\(i\).3587](https://doi.org/10.22610/imbr.v16i1(i).3587).
- Rajabova, M. G., R. S.-A. Makkaeva, and A. Mahluff. 2021. "Strategic Framework for Sustainable Enterprise Development." In *Sustainable Development of Modern Digital Economy*, edited by V. M. Vishnevskiy and A. D. Kudryavtsev, 55–67. Springer. [https://doi.org/10.1007/978-3-030-70194-9\\_4](https://doi.org/10.1007/978-3-030-70194-9_4).
- Rantala, T., M. Saunila, J. Ukko, and H. Rantanen. 2019. "Identifying Strategies for Sustainable Entrepreneurship." In *Palgrave Studies in Sustainable Business in Association With Future Earth*, edited by N. Jansson, 157–176. Palgrave Macmillan. [https://doi.org/10.1007/978-3-319-97385-2\\_12](https://doi.org/10.1007/978-3-319-97385-2_12).
- Rao, S. S. 2006. "Indigenous Knowledge Organization: An Indian Scenario." *International Journal of Information Management* 26, no. 3: 224–233. <https://doi.org/10.1016/j.ijinfomgt.2006.02.003>.
- Schaltegger, S., and M. Wagner. 2011. "Sustainable Entrepreneurship and Sustainability Innovation: Categories and Interactions." *Business Strategy and the Environment* 20, no. 4: 222–237. <https://doi.org/10.1002/bse.682>.
- Slater, A., and S. Park. 2023. "The Relationship Between College Experiences and Middle-Aged Entrepreneurs' Success." *Journal of Student Research* 12, no. 3: 4708. <https://doi.org/10.47611/jsrhs.v12i3.4708>.
- Srikantaiah, D. 2005. "Education: Building on Indigenous Knowledge." *Information Outlook* 9, no. 10: 10–12.
- Stead, J. G., and W. E. Stead. 2013. "The Coevolution of Sustainable Strategic Management in the Global Marketplace." *Organization & Environment* 26, no. 2: 162–183. <https://doi.org/10.1177/1086026613489138>.
- Terán-Yépez, E., G. Marín-Carrillo, M. P. Casado-Belmonte, and M. M. Capobianco-Uriarte. 2020. "Sustainable Entrepreneurship: Review of Its Evolution and New Trends." *Journal of Cleaner Production* 252: 119742. <https://doi.org/10.1016/j.jclepro.2019.119742>.
- Tharakan, J. 2015. "Indigenous Knowledge Systems – A Rich Appropriate Technology Resource." *African Journal of Science, Technology, Innovation and Development* 7, no. 1: 52–57. <https://doi.org/10.1080/20421338.2014.987987>.
- Vaillant, Y., and E. Lafuente. 2019. "Entrepreneurial Experience and the Innovativeness of Serial Entrepreneurs." *Management Decision* 57, no. 1: 107–118. <https://doi.org/10.1108/MD-06-2017-0592>.
- Vasquez-Peñafiel, M.-S., and M. Perello-Marín. 2021. "Sustainable Entrepreneurship in Education Through Science Maps." *Proceedings of the 3rd International Conference: Business Meets Technology* 9, no. 1: 78–89. <https://doi.org/10.4995/bmt2021.2021.13668>.
- Veleva, V. 2020. "The Role of Entrepreneurs in Advancing Sustainable Lifestyles: Challenges, Impacts, and Future Opportunities." *Journal of Cleaner Production* 283: 124658. <https://doi.org/10.1016/j.jclepro.2020.124658>.
- Warren, D. M. 1991. "Using Indigenous Knowledge in Agricultural Development." *World Bank Discussion Papers* 13: 1–45.
- Woolthuis, R. K. 2010. "Sustainable Entrepreneurship in the Dutch Construction Industry." *Sustainability* 2, no. 2: 505–523. <https://doi.org/10.3390/su2020505>.