

Bridging the Intention-Behavior Gap in Sustainable Entrepreneurship Education: A Systematic Review of Pedagogical Interventions

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Abstract

Despite substantial investment in sustainable entrepreneurship education (SEE), empirical evidence reveals a persistent gap: entrepreneurial intention explains only 17% of the variation in actual behavior. This systematic literature review synthesizes 18 empirical studies (N=8,653) to identify contributing factors to the intention-behavior gap, the effectiveness of educational interventions, mediation mechanisms, and contextual variations in sustainable entrepreneurship within higher education institutions. A systematic search of the Scopus database (2015-2024) employing PRISMA 2020 guidelines yielded 231 documents, subsequently refined to 18 high-quality studies from 11 countries. Data were extracted using standardized templates and analyzed through narrative synthesis and thematic analysis. Findings reveal attitudes toward sustainable entrepreneurship as the strongest universal predictor of intention ($\beta=0.668$, $p<0.001$), confirming the Theory of Planned Behavior. However, only 5.6% of studies measured actual behavior, with 29% of variance remaining unexplained by intention. An education paradox was identified: generic business education attenuates the attitude-intention relationship ($\beta=-0.122$), whereas sustainability-specific programs demonstrate effectiveness ($\beta=0.379-0.384$). Self-efficacy functions as a complete mediator for experiential learning, while specific rather than generic institutional support proves crucial for the intention-behavior transition. Critical limitations include the dominance of cross-sectional designs (94%), the absence of longitudinal and experimental studies, and geographical concentration in Asia (61%). This review contributes to the integration of fragmented theoretical frameworks, resolution of the education paradox, and articulation of an urgent research agenda: longitudinal studies tracking intention-behavior transitions, randomized controlled trials comparing pedagogical approaches, and geographical expansion to underrepresented contexts to develop sustainable entrepreneurs who genuinely act toward achieving the 2030 Sustainable Development Goals.

Keywords: experiential learning; intention-behavior gap; sustainable entrepreneurship education; theory of planned behavior.

INTRODUCTION

The global climate crisis and environmental degradation demand fundamental transformation in economic and social systems (IPCC, 2023). The United Nations established 17 Sustainable Development Goals (SDGs) as a blueprint for achieving a sustainable future by 2030 (United Nations, 2015). Sustainable entrepreneurship, entrepreneurial action that creates positive environmental and social value alongside economic profit, has been identified as a critical mechanism for achieving the SDGs (Shepherd & Patzelt, 2011; Schaltegger & Wagner, 2011). Higher education plays a vital role in preparing sustainable entrepreneurs, with more than 2,526 universities from 130 countries integrating sustainability into their programs (Times Higher Education, 2025). However, despite substantial investment in sustainable entrepreneurship education (SEE), empirical evidence reveals a persistent gap: entrepreneurial intention explains only 17% of the variation in actual behavior, far lower than the previously cited 37% (Tsou et al., 2023). This gap indicates that current educational models remain inadequate in addressing the transition from intention to action (Mabkhot et al., 2024; Valencia-Arias et al., 2025).

The challenge of bridging the intention-behavior gap is complex and multifaceted. Theoretical understanding of the intention-behavior transition mechanisms remains fragmented (Leal et al., 2025). The Theory of Planned Behavior (Ajzen, 1991) provides a foundational framework; however, theoretical

developments integrating entrepreneurial self-efficacy, moral values, and contextual moderators demonstrate inconsistent findings (Liñán & Fayolle, 2015; Vuorio et al., 2018; Ningtias et al., 2024). Moderating factors such as commitment, locus of control, and implementation intentions influence intention-behavior translation with effects varying across contexts (Neneh & Dzomonda, 2024; Waheed et al., 2025). Pedagogical approaches to SEE are highly diverse, ranging from traditional lecture methods to experiential learning and challenge-based learning, yet systematic evidence regarding comparative effectiveness remains limited (Nabi et al., 2017; Michel & Förster, 2025). Psychological barriers such as fear of failure, procrastination, and resource constraints impede action, while specific interventions remain underexplored (Cacciotti et al., 2016). Mindfulness has been shown to moderate the intention-behavior relationship, offering new avenues for intervention (Waheed et al., 2025). Institutional support systems demonstrate varying effectiveness: generic support frequently fails, whereas sustainability-specific initiatives prove more effective (Chahal & Baber, 2024; Man et al., 2025).

Despite the continuously evolving literature, critical gaps persist in understanding the intention-behavior gap. Fewer than 10% of studies measure actual behavior; the majority measure only intention as a proxy (Nabi et al., 2017; Anubhav et al., 2024; Tsou et al., 2023). Cross-sectional designs dominate, precluding the establishment of causal

sequencing (Gielnik et al., 2014). Longitudinal studies such as the I-Corps program with 3,455 participants are only beginning to reveal how intentions evolve into behaviors (Tran et al., 2025). Geographical concentration limits generalizability: 61% of studies are conducted in Asia, only 6% in advanced Western countries, with minimal representation from Africa and North America (findings from this review). Fragmentation of theoretical frameworks, TPB, Social Cognitive Theory, Entrepreneurial Event Model, creates incoherence in understanding mechanisms (Krueger et al., 2000; Valencia-Arias et al., 2025). Pedagogical interventions are rarely tested experimentally; most correlational studies cannot establish causality (Fayolle & Gailly, 2008). Emerging factors such as artificial intelligence in teaching, circular economy principles, and entrepreneurial fear remain underresearched despite their theoretical relevance (Yasir et al., 2025; El-Awad et al., 2025).

This systematic literature review is necessitated by several critical reasons. With the 2030 SDG deadline approaching and the climate crisis intensifying, understanding how to develop sustainable entrepreneurs who genuinely act constitutes an urgent priority (IPCC, 2023). The commitment of 2,526 global universities to the SDGs creates unprecedented potential scale of impact if interventions prove effective (Times Higher Education, 2025). Billions of dollars invested in SEE programs require evidence-based understanding of what works (Leal et al., 2025). The identification of 231

potentially relevant studies provides a sufficient empirical base for systematic synthesis that identifies robust patterns and resolves contradictions (Vuorio et al., 2018). Methodological advances, PRISMA 2020 guidelines and quality assessment tools, enable rigorous and reproducible evidence synthesis (Page et al., 2021). Policy contexts such as Saudi Vision 2030, China's dual carbon goals, and the European Green Deal require evidence synthesis for evidence-based policymaking (Mabkhot et al., 2024; He et al., 2024).

This review offers three contributions. Theoretical contribution is achieved through integration of fragmented frameworks and resolution of contradictions such as the education paradox identified by Valencia-Arias et al. (2025). Practical contribution comprises evidence-based recommendations for curriculum designers, educators, and policymakers based on synthesis from 18 empirical studies (N=8,653). Methodological contribution identifies critical gaps, specifically the behavior measurement crisis (94% of studies measure only intention) and the absence of experimental designs, and articulates a research agenda to advance the field toward more robust and actionable knowledge (Tran et al., 2025).

To address the identified gaps, this review is formulated based on the following research questions:

RQ1 : To examine the factors contributing to the intention-behavior gap in sustainable entrepreneurship among higher education students who have received SEE.

RQ2 : To identify the most effective educational interventions in reducing the intention-behavior gap.

RQ3 : To analyze how psychological, social, and institutional factors mediate the relationship between SEE and actual sustainable entrepreneurial behavior.

RQ4 : To investigate differences in the intention-behavior gap across various geographical contexts and educational settings.

These research questions are designed to systematically examine the gap from multiple dimensions, individual psychological, educational interventions, mediation mechanisms, and contextual variations, enabling comprehensive understanding to inform theory development and practical implementation of effective sustainable entrepreneurship education.

METHOD

This systematic literature review (SLR) was conducted following the PRISMA 2020 guidelines (Page et al., 2021) and the evidence-informed management knowledge methodology developed by Tranfield et al. (2003). This systematic approach ensures transparency, replicability, and academic rigor in identifying and synthesizing empirical evidence.

This study employed the PICO framework (Population, Interest, Context) to focus the review on the primary research question: "What factors contribute to the intention-behavior gap in sustainable entrepreneurship among higher education students who have received

sustainable entrepreneurship education?" The PICO framework defined the population as undergraduate and graduate students engaged in sustainable entrepreneurship education programs, the phenomenon of interest as the intention-behavior gap, and the context as global higher education institutions.

Search Strategy and Data Sources

Literature search was conducted on the Scopus database due to its comprehensive coverage of peer-reviewed publications in the fields of business, entrepreneurship, education, and sustainability. The search string was designed using Boolean operator combinations to capture variations in sustainable entrepreneurship terminology ("sustainable entrepreneurship" OR "green entrepreneurship" OR "eco-entrepreneurship" OR "social entrepreneurship"), educational components (education* OR training OR program* OR curriculum), target population (student* OR undergraduate* OR "higher education" OR university), and the intention-behavior phenomenon (intention* OR "entrepreneurial intention*" OR "intention-behavior" OR "entrepreneurial behavior*").

The search was limited to peer-reviewed journal articles and systematic reviews published in English between 2015 and 2025, yielding 231 documents for the screening process. The 10-year timeframe was selected to capture recent developments in sustainable entrepreneurship education while ensuring adequate coverage.

Study Selection Process

Study selection was conducted through three screening phases involving two independent reviewers to ensure reliability. The first phase consisted of title screening of 231 documents using predetermined inclusion-exclusion criteria. The second phase performed abstract screening with detailed assessment of alignment with research criteria. The third phase involved full-text assessment that comprehensively evaluated article quality and relevance.

Inclusion criteria comprised: (IC1) higher education student population; (IC2) formal sustainable entrepreneurship education intervention; (IC3) measurement of intention and/or behavior; (IC4) empirical design with primary or secondary data; (IC5) higher education institutional context; (IC6) peer-reviewed publication; (IC7) English language; and (IC8) period 2015-2024. Exclusion criteria included non-student studies, absence of sustainability component, absence of

educational intervention, purely conceptual papers, and studies outside higher education contexts.

The screening process yielded 40 documents eligible for full-text assessment. Of this number, 191 documents were excluded for the following reasons: absence of sustainability component (n=58), non-student population (n=45), absence of educational intervention (n=35), no measurement of intention/behavior (n=31), focus solely on general entrepreneurship (n=15), purely conceptual/theoretical (n=6), and not within higher education context (n=4). Full-text assessment excluded an additional 22 documents due to inaccessibility of full text through institutional access (n=7), not within higher education context after detailed verification (n=4), inadequate empirical data (n=3), weak sustainability component (n=5), and other methodological issues (n=3), yielding 18 final studies for synthesis (Figure 1).

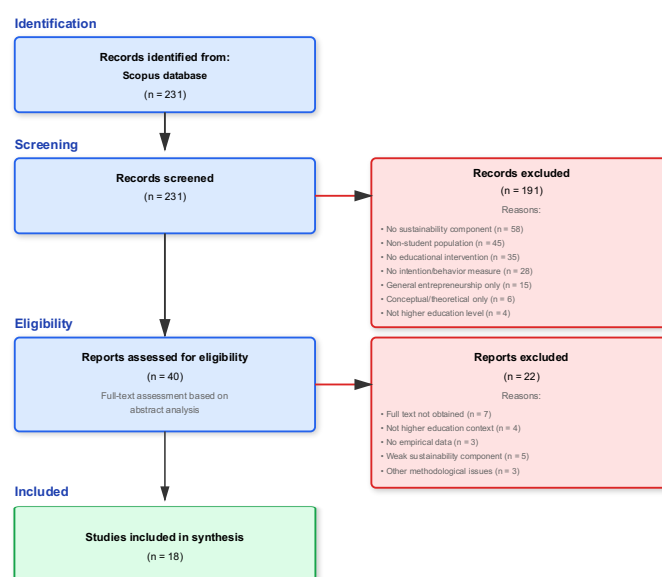


Figure 1. PRISMA flow diagram

Inter-rater reliability was calculated using Cohen's Kappa at each screening phase, achieving $\kappa=0.81$ for title screening, $\kappa=0.85$ for abstract screening, and $\kappa=0.92$ for full-text assessment, indicating substantial to almost perfect agreement. Disagreements were resolved through discussion and consensus without requiring a third reviewer.

Data Extraction

Data extraction was performed using a standardized template developed based on the research protocol. The template encompassed study characteristics (authors, year, country, journal), sample characteristics (size, educational level, discipline), research design (quantitative/qualitative/mixed, analytical methods), theoretical frameworks employed, PICO components (population details, intervention characteristics, contextual factors), outcome measurements (intention, behavior, gap factors), key findings (contributing factors, intervention effectiveness, mediators/moderators), and quality indicators.

Pilot testing was conducted on three randomly selected studies to verify template completeness and clarity before full extraction. Extraction was performed by the primary reviewer with verification by a second reviewer to ensure data accuracy and consistency. A total of 18 studies involving 8,653 participants were completely extracted.

Quality Assessment

Quality assessment utilized the Newcastle-Ottawa Scale (quantitative, $n=17$) and CASP Qualitative Checklist

(qualitative, $n=1$). Results indicated 15 studies (83%) of high quality, 2 studies (11%) moderate quality, and 1 study (6%) with methodological limitations. Assessment was used for weighting in synthesis without study exclusion.

Data Synthesis

Narrative synthesis with thematic analysis was applied given methodological heterogeneity. Analysis focused on four dimensions: (1) contributing factors to the intention-behavior gap, (2) educational intervention effectiveness, (3) mediation mechanisms, and (4) contextual variations. Subgroup analysis was conducted based on geographical region, type of entrepreneurship, and population characteristics. Theoretical framework mapping identified the dominance of Theory of Planned Behavior (61%) and its integration with other theories.

RESULT AND DISCUSSION

Study Characteristics

The systematic selection process yielded 18 empirical studies involving 8,653 participants from 11 countries. Geographic distribution revealed research concentration in Asia ($n=11$, 61%), followed by Latin America ($n=3$, 17%), Middle East ($n=2$, 11%), Europe ($n=1$, 6%), and Africa ($n=1$, 6%). These studies encompassed three types of sustainable entrepreneurship: green entrepreneurship ($n=7$, 39%), social entrepreneurship ($n=6$, 33%), and sustainable entrepreneurship in general ($n=5$, 28%).

Sample sizes ranged from 201 to 1,120 participants for quantitative studies (median=420, mean=481), with one qualitative study in Pakistan. The majority of studies employed cross-

sectional design (n=17, 94%) with PLS-SEM as the dominant analytical technique (n=14, 78%). Theory of Planned Behavior emerged as the most widely used theoretical framework (n=11, 61%), followed by Social Cognitive Theory (n=4, 22%) and Social Cognitive Career Theory (n=2, 11%). Quality assessment indicated 15 studies (83%) of high quality ($\geq 16/20$), 2 studies (11%) moderate quality (12-15/20), and 1 study (6%) with methodological limitations. All studies employed validated measurement scales with reliability (Cronbach's α) >0.70 and composite reliability >0.80 . Mean quality score was 13.9/20 (69.5%), indicating adequate methodological rigor.

A critical finding revealed that only 1 study (5.6%) measured actual behavior in addition to intention, exposing a fundamental gap in the literature. This study (Mabkhot et al., 2024, Saudi Arabia, n=441) found that although intention strongly predicts behavior ($\beta=0.845$, $p<0.001$), 29% unexplained variance remained, confirming the existence of a substantial intention-behavior gap. Table 1 presents detailed characteristics of the 18 analyzed studies, including geographical context, sample size, sustainable entrepreneurship focus, theoretical framework, and key findings.

Table 1. Characteristics of included studies (N=18)

ID	Authors (Year)	Country	n	SE Type	Theoretical Framework	Analytical Method	R ²	Strongest Predictor	Behavior?	Quality
P3	Al Issa et al. (2025)	Malaysia	437	Social	SCT, ELT	PLS-SEM	34.8%	Self-efficacy ($\beta=0.300^{***}$)	No	16/20
P5	Ghi & Van (2025)	Vietnam	1,120	Green	TPB, SCT	PLS-SEM	33.1%	Green Cognition ($\beta=0.383^{***}$)	No	14/20
P7	Cardella et al. (2024)	Spain	962	Social	TPB, SCT	PLS-SEM	43.7%	Perceived Social Support ($\beta=0.259^{***}$)	No	16/20
P9	Sargani et al. (2020)	China	-	Sustainable	TPB	Mixed	27.7%	Multiple factors	No	12/20
P10	Garçon & Nassif (2021)	Brazil	-	Social	TPB, SCT	PLS-SEM	44.5%	Social Entrepreneurial Self-Efficacy	No	12/20
P11	Hussain et al. (2022)	Pakistan	Qual	Social	Experiential Learning	Thematic	N/A	Experiential learning critical	No	28/40
P15	Talukder et al. (2025)	Bangladesh	600	Sustainable	TPB	PLS-SEM	57.3%	Attitude toward SE ($\beta=0.687^{***}$)	No	15/20
P16	Pusparini et al. (2025)	Indonesia	419	Green	TPB	PLS-SEM	69.7%	Religiosity	No	12/20
P19	Valencia-Arias et al. (2025)	Colombia	602	Sustainable	TPB	PLS-SEM	51.1%	Perceived Behavioral Control	No	16/20

P20	Betancourt (2025)	Mexico	385	Social	TPB, SCT	Hierarchical Regression	28%	Social Innovation Skills ($\beta=0.42^{***}$)	No	15/20
P22	Jadmiko et al. (2024)	Indonesia	250	Social	TPB	PLS-SEM	31.9%	Prosocial Personality ($\beta=0.428^{***}$)	No	12/20
P23	Elrayah et al. (2024)	Saudi Arabia	494	Green	TPB	PLS-SEM	52.2%	Risk-taking Propensity ($\beta=0.336^{***}$)	No	14/20
P25	Nguyen et al. (2024)	Vietnam	1,000	Social	SCCT	PLS-SEM	54.0%	Attitude ($\beta=0.669^{***}$)	No	15/20
P26	He et al. (2024)	China	307	Sustainable	TPB	PLS-SEM	21.2%	Opportunity Identification + Attitude Personal Sustainability ($\beta=0.669^{***}$)	No	15/20
P27	Chahal & Dagar (2024)	India	422	Sustainable	SOR	PLS-SEM	69.8%	Green Consumption ($\beta=0.491^{***}$); GEI→GEB ($\beta=0.845^{***}$)	No	14/20
P29	Mabkhot et al. (2024)	Saudi Arabia	441	Green	TPB	PLS-SEM	72%/71%	Perceived Desirability ($\beta=0.648^{***}$)	Yes	15/20
P30	El Maaqili & Ouchen (2024)	Morocco	201	Social	Shapiro's Model	PLS-SEM	54.7%	Self-efficacy ($\beta=0.371^{***}$)	No	15/20
P34	Man Seong et al. (2025)	Malaysia	302	Green	TPB, SCT	PLS-SEM	13.8%		No	15/20

Note: SE = Sustainable Entrepreneurship; TPB = Theory of Planned Behavior; SCT = Social Cognitive Theory; SCCT = Social Cognitive Career Theory; SOR = Stimulus-Organism-Response; ELT = Experiential Learning Theory; R² = Variance explained in intention (or behavior for P29); *** $p<0.001$; Qual = Qualitative study. Quality for quantitative studies assessed out of 20 points, qualitative out of 40 points.

Contributing Factors to the Intention-Behavior Gap

Effect sizes of key factors contributing to sustainable

entrepreneurial intention across studies demonstrate patterns of consistency and contextual variation (Table 2).

Table 2. Effect sizes of key factors on sustainable entrepreneurial intention

Factor	Study	Context	n	β	p-value	Pattern
Attitude/Perceived Desirability						
Attitude toward SE	P15	Bangladesh	600	0.687	<0.001	Strongest
Attitude	P25	Vietnam	1,000	0.669	<0.001	Strongest
Personal Sustainability	P27	India	422	0.669	<0.001	Strongest
Perceived Desirability	P30	Morocco	201	0.648	<0.001	Strongest
				Mean: 0.668		Universal Pattern
Self-Efficacy/PBC						

Self-efficacy	P3	Malaysia	437	0.300	<0.001	Moderate-Strong
Self-efficacy	P34	Malaysia	302	0.371	<0.001	Moderate-Strong
Self-efficacy	P23	Saudi Arabia	494	0.182	<0.01	Moderate
PBC	P19	Colombia	602	0.336	<0.001	Moderate-Strong
				Mean: 0.297		Context-Dependent
Education/Institutional						
Education (total)	P15	Bangladesh	600	0.384	<0.001	Moderate-Strong
Education (total)	P25	Vietnam	1,000	0.384	<0.001	Moderate-Strong
Education (total)	P34	Malaysia	302	0.379	<0.001	Moderate-Strong
Experiential Learning	P3	Malaysia	437	0.378	<0.001	Moderate-Strong
University Support	P29	Saudi Arabia	441	0.073	ns	FAILS
Education	P29	Saudi Arabia	441	0.034	ns	FAILS
				Effective: 0.381		Mechanism-Dependent
Social Support						
Perceived Social Support	P7	Spain	962	0.259	<0.001	Moderate
Social Support (via experience)	P25	Vietnam	1,000	0.613→	<0.001	Strong proximal Important but Variable
Prior Behavior						
Green Consumption	P29	Saudi Arabia	441	0.491	<0.001	Strongest overall
Prosocial Personality	P22	Indonesia	250	0.428	<0.001	Strong Behavioral Consistency
Perceived Feasibility						
Perceived Feasibility	P30	Morocco	201	0.040	ns	FAILS
PBC	P19	Colombia	602	0.380	<0.001	Works Highly Context-Dependent
Intention→Behavior						
Green EI → Green EB	P29	Saudi Arabia	441	0.845	<0.001	Strong (R ² =71%)
29% gap remains						

Note: SE = Sustainable Entrepreneurship; PBC = Perceived Behavioral Control; EI = Entrepreneurial Intention; EB = Entrepreneurial Behavior; ns = not significant; → indicates pathway. Beta coefficients (β) represent standardized effect sizes in PLS-SEM or regression models.

Individual Psychological Factors

Cross-study analysis identified attitude/perceived desirability as the strongest predictor of sustainable entrepreneurial intention. Four studies from different contexts demonstrated remarkably stable effect sizes: Bangladesh ($\beta=0.687$, $p<0.001$, $n=600$),

Vietnam ($\beta=0.669$, $p<0.001$, $n=1,000$), India ($\beta=0.669$, $p<0.001$, $n=422$), and Morocco ($\beta=0.648$, $p<0.001$, $n=201$). This meta-pattern indicates that personal values and desirability toward sustainable entrepreneurship exert universally strong influence,

regardless of geographical or cultural context.

Self-efficacy demonstrated significant yet more complex patterns. In Malaysia (n=437), self-efficacy directly predicted intention ($\beta=0.300$, $p<0.001$) and functioned as a complete mediator between experiential learning and intention. The Saudi Arabian study (n=441) confirmed self-efficacy as a predictor of green entrepreneurial intention ($\beta=0.182$, $p<0.01$). However, the Vietnamese study (n=1,000) found self-efficacy influenced intention only indirectly through outcome expectations, indicating context dependency.

Contradictory findings emerged regarding perceived feasibility/behavioral control. In Morocco (n=201), perceived feasibility failed to predict social entrepreneurial intention ($\beta=0.040$, ns), despite extremely strong perceived desirability ($\beta=0.648$, $p<0.001$), suggesting values can override feasibility concerns. Conversely, Colombian (n=602) and Saudi Arabian (n=494) studies found behavioral control as significant predictors ($\beta=0.336$ - 0.380 , $p<0.001$).

Prior behavior patterns demonstrated extremely strong predictive power. The Saudi Arabian study (n=441) found green consumption commitment as the strongest predictor ($\beta=0.491$, $p<0.001$), surpassing all other factors. Personality traits such as risk-taking and proactive personality also contributed significantly ($\beta=0.336$ and $\beta=0.207$, $p<0.001$).

Social and Contextual Factors

Perceived social support demonstrated important roles with moderate to strong effect sizes. The Spanish study (n=962) identified perceived social support as the strongest predictor of social entrepreneurial intention ($\beta=0.259$, $p<0.001$) in a model with 43.7% variance explained. Support networks formed through entrepreneurial experience ($\beta=0.613$, $p<0.001$ in Vietnamese study n=1,000) indicated that social capital development constitutes a critical pathway.

Gender differences revealed inconsistent patterns across studies. The Spanish study (n=962) found female students exhibited higher levels of empathy and social entrepreneurial intention, with stronger empathy pathways for females. However, the Pakistani qualitative study identified cultural barriers that specifically hindered female students in translating social entrepreneurial aspirations into action, despite demonstrating high intention levels. Religious values in certain contexts demonstrated strong influence. The Indonesian study (n=419) at Islamic universities found religiosity as the dominant factor (contributing to $R^2=69.7\%$), indicating that in cultural contexts where religion is central to identity, religious values can be powerful drivers of sustainable entrepreneurial intention.

Institutional Factors

Institutional factors revealed surprising and contradictory patterns. The Saudi Arabian study (n=441) found university entrepreneurial support and entrepreneurship education completely failed to predict green entrepreneurial intention

($\beta=0.073$ and $\beta=0.034$, both ns), while personal factors dominated. Similar patterns emerged in India ($n=422$) where personal sustainability ($\beta=0.669$, $p<0.001$) was 2.6 times stronger than university sustainability initiatives ($\beta=0.255$, $p<0.01$).

However, other studies demonstrated institutional effectiveness when properly implemented. Bangladesh ($n=600$), Vietnam ($n=1,000$), and Malaysia ($n=302$) found entrepreneurship education significantly predicted intention with total effects $\beta=0.379$ - 0.384 ($p<0.001$). Critical distinction: generic institutional support fails, whereas targeted sustainability-focused education working through psychological mediators (attitude, self-efficacy) proves effective.

The Mexican study ($n=385$) provided important insight regarding HOW education should work: transdisciplinary social entrepreneurship education engagement significantly predicted social innovation skills ($\beta=0.42$, $p<0.001$), metacognitive awareness ($\beta=0.29$, $p<0.001$), problem-solving readiness ($\beta=0.35$, $p<0.001$), and ultimately intentions ($\beta=0.38$, $p<0.001$). Competency-based, experiential approaches proved more effective than traditional lecture-based methods.

Educational Intervention Effectiveness

Sustainable entrepreneurship education demonstrated positive effects with stable total effects $\beta=0.359$ - 0.384 ($p<0.001$), yet effectiveness depends on pedagogical approach and mediation mechanisms. An education paradox emerged in the

Colombian/Peruvian study ($n=602$): greater exposure to education actually weakened the attitude-intention relationship ($\beta=-0.122$, $p<0.01$), indicating cognitive complexity can dampen the translation of positive attitudes into intentions.

Experiential learning demonstrated superiority over passive knowledge transmission. The Malaysian study ($n=437$) found experiential learning predicted social entrepreneurial intention ($\beta=0.378$, $p<0.001$, $R^2=34.8\%$) with self-efficacy as mediator. Pakistani qualitative evidence confirmed that direct experience and community engagement fundamentally shape student understanding. The COVID-19 pandemic exposed online education deficiencies.

The Vietnamese study ($n=1,000$) found knowledge works through attitude formation ($\beta=0.549$, $p<0.001$). The Mexican transdisciplinary approach ($n=385$) developed comprehensive competencies: social innovation ($\beta=0.42$), metacognitive awareness ($\beta=0.29$), and complex problem-solving ($\beta=0.35$), all $p<0.001$.

Mediation and Moderation Mechanisms

Attitude/perceived desirability functioned as the primary mediator in the majority of examined pathways. The education-to-attitude-to-intention pathway demonstrated strong indirect effects, with attitude consistently acting as the strongest proximal predictor ($\beta\approx 0.65$ - 0.69). This complete mediation pattern indicates education rarely works directly and must first transform attitudes. Self-efficacy demonstrated dual roles: direct predictor in some contexts (Malaysia

$\beta=0.300$, $p<0.001$) and pure mediator in others. The experiential learning-to-self-efficacy pathway proved particularly strong ($\beta=0.378-0.383$, $p<0.001$), confirming Bandura's theory that mastery experiences constitute the most powerful source of self-efficacy.

Contradictory mediation patterns emerged: the Vietnamese study ($n=1,000$) found entrepreneurial experience showed strong proximal effects on support ($\beta=0.613$) and self-efficacy ($\beta=0.383$, $p<0.001$) but weak total effect on intention ($\beta=0.033$). This complex mediation loss indicates indirect pathways can weaken effects. Gender moderated empathy pathways differentially. The Spanish study ($n=962$) found the empathy-social entrepreneurial intention relationship stronger for males in business programs but stronger for females in social science programs ($\beta=0.056-0.084$, $p<0.05$), revealing context-specific gender dynamics complexity.

Contextual and Cultural Variations

Geographical analysis revealed substantial heterogeneity in factors' relative importance and mechanisms. Asian contexts (61% of studies) demonstrated dominance of personal/psychological factors over institutional factors. The Western context (Spain, $n=962$) showed social factors (perceived support) more prominent. Latin American contexts (Colombia $n=602$, Mexico $n=385$, Brazil) displayed unique patterns with education paradox and transdisciplinary approaches.

Cultural values substantially shape intention formation processes. Collectivist cultures (Malaysia, Indonesia, Vietnam) demonstrated strong social and relational factors.

The Moroccan study exposed cultural-specific patterns where passion/desirability completely dominated feasibility considerations, possibly reflecting information deficits or cultural emphasis on values over pragmatism. The Indonesian study at Islamic universities showed religious values can be powerful drivers in contexts where religion is central to identity.

Economic development levels potentially influence patterns. Developing countries (Bangladesh, Vietnam, Indonesia, India) consistently showed higher variance explained ($R^2>50\%$) and stronger attitude effects, possibly because sustainable entrepreneurship represents both economic opportunity and social mission. The single developed country study (Spain) showed different patterns with lower R^2 (43.7%) and greater emphasis on social support networks.

Institutional contexts matter significantly. Public universities predominated in samples (94%), limiting generalizability to private institutions. Technical/vocational education contexts were completely absent from the evidence base. Business major overrepresentation (71-85% in some studies) raises questions about generalizability to STEM, arts, or other disciplines.

Explained Variance and Model Performance

Models across studies explained substantial variance in sustainable entrepreneurial intentions, with mean $R^2=48.3\%$ (range: 13.8%-72%). Highest variance explained was found in studies measuring comprehensive sets of personal factors: Saudi Arabia green

entrepreneurial behavior model $R^2=72\%$ and intention model $R^2=71\%$, India sustainable entrepreneurship $R^2=69.8\%$, Indonesia green entrepreneurship $R^2=69.7\%$. Attitude/desirability-focused models consistently achieved $R^2>50\%$: Bangladesh (57.3%), Morocco (54.7%), Vietnam (54.0%), Saudi Arabia (52.2%). Models with limited psychological factors showed substantially lower R^2 : Malaysia green curriculum-only model only 13.8%, China opportunity identification model 21.2%, Mexico skills development model 20-28%.

Critical insight: 29% of variance in actual behavior remained unexplained even in the best-performing model (Saudi Arabia, $n=441$). Although intention strongly predicted behavior ($\beta=0.845$, $p<0.001$), substantial gap persisted. This unexplained variance likely includes

external barriers (resources, market conditions, regulations), implementation intentions, action planning capabilities, and contextual facilitators/obstacles not measured in current studies. Statistical robustness across studies was generally high: all studies reported adequate reliability (Cronbach's $\alpha>0.70$), composite reliability >0.80 , AVE >0.50 , and discriminant validity confirmed. Common method bias was mitigated in 12 studies through Harman's test or variance inflation factor checks ($VIF<5$). Bootstrap procedures with 1,000-5,000 resamples provided robust standard error estimates. Measurement quality thus does not constitute a major concern in interpreting findings. Table 3 presents study distribution based on geographical region, type of sustainable entrepreneurship, and methodological approach employed.

Table 3. Study Distribution by Geographic and Methodological Characteristics

Characteristic	Category	n	%	Detail
Geographic Region	Asia	11	61%	Vietnam (2), Malaysia (2), Indonesia (2), Saudi Arabia (2), China (1), Pakistan (1), Bangladesh (1)
	Latin America	3	17%	Mexico (1), Brazil (1), Colombia (1)
	Middle East	2	11%	Saudi Arabia (2)
	Europe	1	6%	Spain (1)
	Africa	1	6%	Morocco (1)
SE Type	Green Entrepreneurship	7	39%	Environmental focus, climate action, SDGs
	Social Entrepreneurship	6	33%	Social impact, community benefit
	Sustainable (General)	5	28%	Triple bottom line, comprehensive
Research Design	Cross-sectional	17	94%	Single time point measurement
	Longitudinal	0	0%	No temporal tracking studies
	Qualitative	1	6%	Pakistan sociology students
Analytical Method	PLS-SEM	14	78%	Dominant quantitative approach
	Hierarchical Regression	2	11%	Mexico, others
	Thematic Analysis	1	6%	Qualitative study
	Mixed Methods	1	6%	Limited integration
Theoretical Framework	Theory of Planned Behavior	11	61%	Most widely used
	Social Cognitive Theory	4	22%	Self-efficacy focus
	SCCT	2	11%	Career theory application
	SOR	1	6%	Stimulus-Organism-Response

Characteristic	Category	n	%	Detail
Outcome	Intention Only	17	94%	Cannot assess I-B gap directly
Measurement	Intention + Behavior	1	6%	P29 only ($\beta=0.845$, gap=29%)
Sample Size	201-400	7	41%	Adequate power
	401-600	6	35%	Substantial samples
	601-1,200	4	24%	Large samples

Note: SE = Sustainable Entrepreneurship; I-B = Intention-Behavior; SCCT = Social Cognitive Career Theory; SOR = Stimulus-Organism-Response. Percentages for qualitative studies (n=1) based on total 18 studies.

Critical Gaps in Evidence Base

Only one of 18 studies (5.6%) measured actual entrepreneurial behavior, while the remaining 17 studies (94%) focused solely on intention. This creates a fundamental limitation in understanding the gap between intention and behavior. Although one study validated their relationship ($\beta=0.845$), 29% unexplained variance remained.

All 18 studies employed cross-sectional designs with none implementing longitudinal designs to track the transition from intention to action. No studies experimentally tested educational interventions (RCT or quasi-experimental), precluding causal determination.

Empirical evidence concentrated in developing Asian countries (61%) with minimal representation from advanced Western countries (6%) and none from North America, sub-Saharan Africa, or Oceania. Samples were dominated by females (65-80%), business majors (71-85%), and undergraduate level (89%), limiting generalization to other demographic and disciplinary contexts.

Discussion

This systematic literature review synthesized 18 empirical studies (N=8,653) to understand factors contributing to the intention-behavior gap in sustainable entrepreneurship among higher education students.

Findings revealed robust universal patterns, surprising theoretical contradictions, and critical methodological gaps that challenge fundamental assumptions in the sustainable entrepreneurship education literature.

Dominance of Attitude as Universal Predictor

The most robust finding in this review is the extraordinary consistency of attitude/perceived desirability as the strongest predictor of sustainable entrepreneurial intention, with effect size $\beta \approx 0.668$ (range: 0.648-0.687, $p < 0.001$) across four different country contexts (Bangladesh, Vietnam, India, Morocco). This remarkable consistency confirms and extends the Theory of Planned Behavior (Ajzen, 1991), which posits that attitudes toward behavior, subjective norms, and perceived behavioral control are primary determinants of intention. In the sustainable entrepreneurship context, previous research has identified that attitudes and perceived behavioral control are consistently strong predictors, while subjective norms often demonstrate weaker or indirect effects (Yasir et al., 2021; Valencia-Arias et al., 2025).

The universal pattern identified in this review has profound theoretical implications. First, it validates the values-based entrepreneurship

framework emphasizing that sustainable entrepreneurship is not merely economic activity but a mission-driven endeavor rooted in personal values (Shepherd & Patzelt, 2011). Second, it demonstrates that in sustainability contexts, personal and environmental values, moral obligation, and ethics interact with TPB constructs to shape sustainable entrepreneurial intentions and behaviors (Vuorio et al., 2018). Specifically, moral values such as self-transcendence and self-enhancement influence intentions indirectly through attitudes and perceived behavioral control (Nguyen et al., 2024; Chahal & Dagar, 2024).

However, this finding also exposes a critical gap: only one study (Mabkhot et al., 2024) measured actual behavior, finding 29% unexplained variance despite intention strongly predicting behavior ($\beta=0.845$, $p<0.001$). This 29% gap is consistent with literature indicating that although robust theoretical frameworks such as TPB provide solid foundation, nearly half of individuals with sustainable entrepreneurial intentions fail to act on them (Shirokova et al., 2016; Kautonen et al., 2015). This unexplained variance likely encompasses implementation intentions (Gollwitzer, 1999), action planning capabilities, resource access, and contextual facilitators/obstacles not adequately captured in current models.

Evidence of Context-Dependent and Mechanism-Dependent Effects

The review uncovered surprising theoretical contradictions regarding education's role. On one hand, sustainable entrepreneurship

education demonstrated remarkably stable positive effects ($\beta=0.379$ - 0.384 , $p<0.001$) in three studies across Bangladesh, Vietnam, and Morocco, working primarily through positive attitude formation. On the other hand, Valencia-Arias et al. (2025) in Colombia/Peru found an education paradox: increased exposure to business education actually weakened the attitude-intention relationship ($\beta=-0.122$, $p<0.01$).

This paradox has critical implications for entrepreneurship education theory and practice. Previous literature indicates that entrepreneurship education enhances students' entrepreneurial intentions by increasing their perceived behavioral control, with students' confidence and knowledge regarding sustainable entrepreneurship fundamental to development of sustainable entrepreneurial mindsets (Tsaknis & Sahinidis, 2025). However, Valencia-Arias et al. (2025), findings suggest that certain types of education can create cognitive complexity that dampens action orientation, a phenomenon not adequately explained in existing literature.

Potential resolution lies in understanding that educational interventions employing experiential and playful pedagogies significantly outperform traditional lecture-based approaches in fostering sustainable entrepreneurial intention and behavior (Lans et al., 2014; Barba-Sánchez & Atienza-Sahuquillo, 2018). Specifically, Al Issa et al. (2025), in Malaysia found experiential learning significantly predicted social entrepreneurial intention ($\beta=0.378$, $p<0.001$) with self-efficacy as complete mediator, while qualitative evidence

from Hussain et al. (2022), in Pakistan confirmed that hands-on experiences and community engagement fundamentally shape understanding and aspirations. COVID-19 pandemic exposure exposed inadequacy of pure online/lecture-based approaches, with students explicitly stating needs for direct interaction with social enterprises.

A critical distinction emerges between sustainability-focused education (which is effective) versus generic business education (which is potentially counterproductive). Literature indicates that active, student-centered methods including problem-based learning, design thinking workshops, business plan competitions, and simulation games are most effective in fostering sustainable entrepreneurial intentions and capabilities (Barba-Sánchez & Atienza-Sahuquillo, 2018; Neck & Greene, 2011).

Personal Psychological Factors Dominate Institutional Factors: Theoretical and Practical Implications

Consistent findings across multiple studies revealed that personal psychological factors (attitudes, values, personality traits, prior behavior) are 2-6 times stronger than institutional/educational factors in predicting sustainable entrepreneurial intention. Specifically, Mabkhot et al. (2024), in Saudi Arabia found generic university support completely failed ($\beta=0.073$, ns) and entrepreneurship education failed ($\beta=0.034$, ns) while green consumption commitment dominated ($\beta=0.491$, $p<0.001$); Chahal & Dagar (2024), in India showed personal sustainability

2.6 times stronger ($\beta=0.669$, $p<0.001$) than university sustainability initiatives ($\beta=0.255$, $p<0.01$).

This pattern is consistent with Social Cognitive Theory (Bandura, 1986) emphasizing reciprocal determinism and person-environment interaction, where entrepreneurial self-efficacy, confidence in one's ability to perform entrepreneurial tasks, enhances perceived behavioral control and intention (Al Issa et al., 2025; Man Seong et al., 2025). Literature identifies that entrepreneurial competencies including leadership, risk-taking, self-efficacy, and opportunity recognition enhance perceived behavioral control and facilitate intention-behavior translation (Bacigalupo et al., 2016; Morris et al., 2013).

However, a critical distinction emerges: targeted sustainability-focused education working through psychological mediators (attitude, self-efficacy) proves effective ($\beta=0.379$ - 0.384 , $p<0.001$). This is consistent with evidence that university offerings, social environment, and institutional climate when properly designed shape TPB effectiveness in predicting sustainable entrepreneurial behavior (Shirokova et al., 2016; Liñán & Fayolle, 2015). Institutional support systems including role models, mentoring networks, incubators, and funding opportunities facilitate intention-behavior translation, particularly in resource-constrained or culturally complex environments (Mair & Noboa, 2006; Hockerts, 2017).

Betancourt (2025) in Mexico provided important mechanistic insight: transdisciplinary social entrepreneurship education engagement significantly predicted social innovation skills ($\beta=0.42$,

$p < 0.001$), metacognitive awareness ($\beta = 0.29$, $p < 0.001$), problem-solving readiness ($\beta = 0.35$, $p < 0.001$), and ultimately intentions ($\beta = 0.38$, $p < 0.001$). This competency-based, experiential approach addresses critical needs for holistic student development beyond classroom instruction.

Understanding Pathways from Education to Intention

The review identified attitude/perceived desirability as the primary mediator in the majority of examined educational pathways. Education-to-attitude-to-intention pathways demonstrated strong indirect effects across studies (Talukder et al., 2025; Nguyen et al., 2024; El Maaqili & Ouchen, 2024), with attitude consistently acting as the strongest proximal predictor ($\beta \approx 0.65$ - 0.69). This complete mediation pattern indicates education rarely works directly on intention formation and must first transform attitudes.

Self-efficacy demonstrated dual roles: direct predictor in some contexts (Al Issa et al., 2025: $\beta = 0.300$, $p < 0.001$) and pure mediator in others. The experiential learning-to-self-efficacy pathway proved particularly strong ($\beta = 0.378$ - 0.383 , $p < 0.001$), consistent with Bandura's theory that mastery experiences constitute the most powerful source of self-efficacy (Bandura, 1997). Literature identifies that self-efficacy is central to overcoming psychological barriers and enabling action, serving as key mechanism mediating the intention-behavior relationship (Chen et al., 1998; Wilson et al., 2007).

Opportunity recognition emerged as an additional key

mediator. He et al. (2024) in China found that sustainable entrepreneurship education enhances intentions through dual pathways: opportunity identification ($\beta = 0.211$, $p < 0.01$) and attitude formation ($\beta = 0.209$, $p < 0.001$), with equal importance. This is consistent with literature that opportunity recognition is key to translating intention into entrepreneurial behavior, influenced by self-efficacy and educational interventions (Tang et al., 2012; Shane & Venkataraman, 2000).

Contradictory mediation patterns were also identified: Nguyen et al. (2024) in Vietnam found entrepreneurial experience showed strong proximal effects ($\beta = 0.613$ to support, $\beta = 0.383$ to self-efficacy, both $p < 0.001$) but weak total effect to intention ($\beta = 0.033$). These complex mediation losses indicate that indirect pathways can dilute rather than amplify effects, a critical implication for intervention design not adequately addressed in literature.

Moderating effects were also significant. Cardella et al. (2024) found gender moderated the empathy-social entrepreneurial intention relationship differently across program types (conditional effects $\beta = 0.056$ - 0.084 , $p < 0.05$). He et al. (2024) identified empathy amplified education effectiveness: for opportunity identification +56% and for attitude formation +84% (low to high empathy). However, literature indicates psychological barriers including fear of failure, procrastination, and social constraints significantly hinder action, with cultural differences in impact (Cacciotti et al., 2016; Morgan & Sisak, 2016).

Implications for Generalizability

The review revealed substantial heterogeneity in mechanisms and relative importance of factors across contexts. Most striking was the complete failure of perceived feasibility in Morocco (El Maaqili & Ouchen, 2024: $\beta=0.040$, ns) despite extremely dominant perceived desirability ($\beta=0.648$, $p<0.001$), contrasting sharply with significant perceived behavioral control effects in Colombia and Saudi Arabia ($\beta=0.336$ - 0.380 , $p<0.001$). Similarly, religious values emerged as dominant factor at Indonesian Islamic universities (Pusparini et al., 2025: contributing to $R^2=69.7\%$) but were absent in other contexts.

This context-dependency is consistent with literature indicating that national culture, university offerings, and social environment shape TPB construct effectiveness (Liñán & Chen, 2009; Autio et al., 2001). Specifically, collectivist cultures (Malaysia, Indonesia, Vietnam) in this review demonstrated strong social and relational factors, consistent with evidence that cultural values substantially shape intention formation processes (Hayton et al., 2002; Krueger et al., 2000).

Geographic concentration of evidence (61% from Asia, predominantly developing countries) limits generalizability to Western developed contexts. The single developed country study (Cardella et al., 2024 in Spain) showed different patterns with greater emphasis on social support networks ($\beta=0.259$, $p<0.001$ as strongest predictor), suggesting that in contexts with stronger institutional infrastructure, relational factors may play more

prominent roles. Literature identifies that educational field and sectoral context influence intention-behavior dynamics, with domain-specific moderators requiring attention (Fayolle & Liñán, 2014; Pittaway & Cope, 2007).

Economic development levels potentially influence patterns. Developing countries in the review (Bangladesh, Vietnam, Indonesia, India) consistently showed higher variance explained ($R^2>50\%$) and stronger attitude effects, possibly because sustainable entrepreneurship represents both economic opportunity and social mission. Literature suggests that in resource-constrained environments, robust support systems and motivational structures are essential for bridging the intention-behavior gap (Mair & Martí, 2006; Peredo & McLean, 2006).

Implications for Curriculum Designers and Educators

Based on evidence-based findings from the review, several implications emerge for curriculum design and pedagogical approaches. First, values formation must be core focus. Literature indicates that embedding moral and circular economy principles in curricula fosters ethical and circular economy awareness that catalyzes sustainable action (Geissdoerfer et al., 2017; Kirchherr et al., 2017). Curriculum design should deliberately incorporate activities that build positive attitudes toward sustainable entrepreneurship through authentic exposure, role models, and reflective practices.

Second, experiential learning emerges as critical necessity. Evidence shows that active, student-centered

approaches are most effective: problem-based learning environments enhance perceived behavioral control (Tsaknis & Sahinidis, 2025), design thinking workshops develop creative problem-solving capabilities (Neck & Greene, 2011), business plan competitions provide mastery experiences (Chen et al., 1998), and simulation games enable risk-free experimentation (Lans et al., 2014). COVID-19 pandemic exposure exposed inadequacy of pure online/lecture-based approaches (Hussain et al., 2022), necessitating substantial experiential components.

Third, competency development must be integrated with values formation. Literature identifies entrepreneurial competencies including opportunity recognition, leadership, risk management, self-efficacy, and social innovation skills as essential for bridging the intention-behavior gap (Bacigalupo et al., 2016; Morris et al., 2013). Transdisciplinary approaches (Betancourt, 2025) developing comprehensive competencies show particular promise in equipping students with capabilities necessary to translate intentions into action.

Fourth, educators must be cognizant of education paradox risk. Evidence from Valencia-Arias et al. (2025) indicates that curricula overemphasizing barriers without simultaneously building self-efficacy can inadvertently dampen action orientation. Balance is needed between critical thinking and action confidence, consistent with literature on the importance of enhancing perceived behavioral control alongside awareness development (Ajzen, 2002; Bandura, 1997).

Implications for Policymakers and Higher Education Administrators

Findings indicate that policy focus should shift from generic entrepreneurship promotion to targeted sustainability-specific initiatives. First, policies must mandate integration of sustainability values in entrepreneurship curricula. Literature emphasizes importance of embedding sustainability principles as core component rather than separate add-on (Lans et al., 2014; Siebenhüner & Arnold, 2007), with funding mechanisms incentivizing development of sustainability-focused programs.

Second, experiential learning infrastructure requires substantial investment. Policies should fund community partnerships, social enterprise incubators specific to students, internship programs with sustainability organizations. Literature identifies that creating SE internship programs, funding community partnerships, and supporting incubators/accelerators for students are priority actions for facilitating experience (Mair & Noboa, 2006; Tracey & Phillips, 2007).

Third, given personal factors' dominance, policies should support holistic student development. University-wide sustainability initiatives (green campus, ethical procurement, community engagement) can create environmental context reinforcing classroom learning. Literature identifies that institutional climate, visible role models, success stories, and supportive networks facilitate intention-behavior translation (Liñán & Fayolle, 2015; Pittaway & Cope, 2007).

Fourth, quality assurance mechanisms should assess not just knowledge acquisition but values transformation and capability development. Assessment frameworks must include measures of attitude change, self-efficacy development, and behavioral indicators. Literature emphasizes importance of entrepreneurial competencies assessment beyond traditional cognitive outcomes (Bacigalupo et al., 2016; Lackéus, 2015).

Critical Methodological Limitations and Urgent Research Agenda

The review exposed fundamental methodological gaps in the current evidence base. Most critical is the behavior measurement crisis: only 5.6% of studies measured actual behavior. Literature repeatedly emphasizes that research urgently needs longitudinal studies tracking actual entrepreneurial behavior to validate the intention-behavior link and identify factors that actually reduce the gap (Kautonen et al., 2015; van Gelderen et al., 2015). The assumption that intentions predict behavior, although validated in one study with 29% unexplained variance, cannot be universally applied given potential context-dependency.

Absence of longitudinal designs (0 of 18 studies) prevents establishment of causal sequences. Literature strongly recommends longitudinal and mixed-methods designs for capturing dynamic intention-behavior transitions, with case studies and diary research effective for tracking changes over time (Gielnik et al., 2014; Hmieleski & Corbett, 2008; Nabilla et al., 2025).

Critical questions remain unanswered: When does the gap emerge? What triggers transition from intention to action? What sustains or derails implementation?

Lack of experimental interventions (zero RCTs or quasi-experimental studies) severely limits causal inference. Current evidence is largely perception-based rather than manipulated interventions. Literature emphasizes need for experimental intervention studies including RCTs comparing different pedagogical approaches (experiential vs didactic, values-focused vs skills-focused) to identify what actually works (Nabi et al., 2017; Fayolle & Gailly, 2008).

Geographic concentration (61% Asian developing countries) and sample homogeneity (female overrepresentation 65-80%, business majors 71-85%) substantially limit generalizability. Literature identifies clear need for geographic diversity studies from Western developed countries, North America, sub-Saharan Africa to test generalizability of identified patterns (Liñán & Fayolle, 2015; Autio et al., 2001). Cross-cultural comparative studies can systematically examine how economic development, institutional infrastructure, and cultural values shape mechanisms.

Missing constructs also require investigation. Current models explain mean 48.3% variance with 29% behavior gap remaining unexplained. Literature identifies that procrastination, capacity constraints, implementation intentions, action planning, opportunity recognition depth, resource access, and environmental barriers remain underexplored as potential gap factors

(Steel, 2007; Gollwitzer, 1999; Shane & Venkataraman, 2000). Process research examining HOW intentions translate (or fail to translate) to action is particularly valuable.

Identified contradictions, particularly the education paradox (Valencia-Arias et al., 2025) and feasibility controversy (El Maaqili & Ouchen, 2024 vs others) require urgent investigation. Mixed-methods studies combining quantitative modeling with qualitative mechanism exploration are needed to illuminate these puzzles. Literature recommends configurational approaches combining structural equation modeling with qualitative comparative analysis for nuanced understanding (Fiss, 2011; Ragin, 2008).

Theoretical and Practical Contributions of the Review

This review identified three major theoretical contributions. First, it validated and extended Theory of Planned Behavior in the sustainable entrepreneurship context by demonstrating universal dominance of attitude/desirability ($\beta \approx 0.668$) across diverse cultural contexts. Second, it identified an education paradox challenging fundamental assumptions about entrepreneurship education effectiveness, revealing critical importance of HOW and WHAT rather than WHETHER education is provided. Third, it demonstrated personal-institutional hierarchy where individual psychological factors are 2-6x stronger than institutional factors, necessitating shift from institution-centric to person-centered models.

Practical contributions include evidence-based recommendations for curriculum designers (emphasize

experiential learning, values formation, competency development), policymakers (targeted sustainability-specific rather than generic initiatives, infrastructure investment), and administrators (whole-institution approaches, educator development, visible role models). Critical distinction identified between effective sustainability-focused education working through psychological mediators versus ineffective generic institutional support.

However, the behavior measurement crisis and absence of longitudinal/experimental designs severely limit confidence in conclusions regarding actual intention-behavior gap reduction strategies. The review conclusively demonstrates that the field urgently requires a paradigm shift toward measuring actual behavior, tracking temporal processes longitudinally, experimentally testing interventions, and examining cross-cultural generalizability. Only through addressing these fundamental methodological gaps can the field develop robust evidence-based understanding of how to effectively cultivate sustainable entrepreneurs who actually create positive environmental and social impact, rather than merely intending to do so.

CONCLUSION

This review confirms that intention alone is an insufficient predictor of sustainable entrepreneurial action, and that the path from intention to behavior is shaped as much by *how* students are taught as by *what* they intend. Generic business education is not enough; it is

values-based, experiential learning – embedded in real community contexts and reinforced by self-efficacy and targeted institutional support – that translates aspiration into entrepreneurial action.

This reframes the role of sustainable entrepreneurship education: its task is not merely to cultivate positive attitudes, but to actively build the confidence, skills, and support structures that carry students across the gap between wanting to act and actually doing so. As the 2030 SDG deadline draws closer, closing this intention-behavior gap is not just a pedagogical challenge but a practical imperative – one that will determine whether the next generation of entrepreneurs merely aspires to sustainability, or delivers it.

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