

Fostering Entrepreneurial Mindsets: An Empirical Investigation of Entrepreneurial Intentions Among Pakistani University Students

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Abstract

This study explores the factors shaping entrepreneurial intentions among university students in Pakistan, using a robust conceptual framework built on the Theory of Planned Behavior. The study explores the impact of internal locus of control, entrepreneurial learning, perceived mentoring support, attitudes towards entrepreneurship, social norms, and entrepreneurial self-efficacy on the inclination of students toward entrepreneurship based on survey results of 412 students in the major Pakistani higher education institutions. Based on the results of the Partial Least Squares Structural Equation Modeling (PLS-SEM) which has been performed using SmartPLS 4.0, it is shown that attitude toward entrepreneurship is the strongest predictor of entrepreneurial intentions ($\beta = 0.423$, $p < 0.001$), followed by entrepreneurial self-efficacy ($\beta = 0.312$, $p < 0.0001$). The research also confirms the mediating effects of attitude and social norms, whereas the entrepreneurial self-efficacy is demonstrated to have significant moderating effects in the crucial relationships. These findings contribute to the body of entrepreneurship literature and have practical implications to educators, policymakers, and entrepreneurship support institutions that are striving to instill an entrepreneurial culture in young people in Pakistan.

Keywords: *Entrepreneurial intentions, university students, Theory of Planned Behavior, structural equation modelling.*

Introduction

Entrepreneurship has become a fundamental catalyst for economic advancement, employment generation, and technological progress across both advanced and emerging economies (Acs et al., 2018; Audretsch & Keilbach, 2004). In developing nations, including Pakistan with high youth unemployment rates that still put a strain on social and economic systems, it has become a critical priority to develop entrepreneurial intentions among higher education students to ensure long-term and sustainable development (GEDI, 2022). This has made it more pertinent to determine what influences young people to be entrepreneurial as a viable career choice by scholars, policy makers, and practitioners in the field of economic development. The entrepreneurial scenery of Pakistan has changed significantly during the last decade. Having a population of over 240 million (including about 64 percent of the population under 30 years old), Pakistan has an enormous demographic dividend that can be utilized through entrepreneurship (Pakistan Bureau of Statistics, 2023). Nonetheless, the entrepreneurial activity in the country is not as high as it could be despite the multiple efforts of governments and the development of startup ecosystems in large cities, such as Karachi, Lahore, and Islamabad (Global Entrepreneurship Monitor, 2023).

College students make an exceptionally valuable population when it comes to the study of entrepreneurship since this is the period of life when decisions about careers are made and career goals are developed (Krueger et al., 2000). The learning setting offers special chances to have entrepreneurial skills, exposing learners to entrepreneurial role models, and shaping their attitude to self-employment (Fayolle & Gailly, 2015). The knowledge of what factors affect entrepreneurial intentions in this formative stage can be used to develop more effective entrepreneurship education programs and support structures. This research has some significant implications in the entrepreneurship literature. First, it combines various theoretical lenses on entrepreneurial intentions, such as personality aspects, learning, mentoring, and cognitive factors, into a unified framework of understanding entrepreneurial intentions. Second, it offers empirical data of Pakistan, which is a poorly studied setting, which provides a unique learning about entrepreneurship in emerging economies with specific cultural and institutional features. Third, it uses stringent structural equation modelling methods with SmartPLS to examine multifaceted associations among various constructs.

Theoretical Foundations

The theoretical landscape of entrepreneurial intentions has been molded by a number of landmark frameworks. The Theory of Planned Behavior (TPB) by Ajzen (1991), is the root cause of explaining the development of intentions and their ultimate outcome in action. According to TPB, behavioral intentions are formed as a result of three fundamental determinants: attitude towards a specific behavior, subjective norms, and perceived behavioral control. This model has been broadly used in the field of entrepreneurship research, and meta-analytic studies have demonstrated its predictive ability on the intentions of entrepreneurs (Schlaegel and Koenig, 2014). Going beyond TPB, the Entrepreneurial Event Model (EEM) by Shapero and Sokol (1982) emphasizes perceived desirability and perceived feasibility in entrepreneurial decision-making. The model argues that the propensity of the individual to entrepreneurship is determined by whether the individual perceives it as desirable and accessible to him or her, which in turn is determined by cultural values, social norms and past individual experience (Krueger et al., 2000). The Social Cognitive Theory by Bandura (1986) adds the notion of self-efficacy that has been very useful in the study of entrepreneurship. In this respect, entrepreneurial self-efficacy reflects a person in the belief in his or her ability to perform entrepreneurial tasks and overcome the difficulties that accompany the start of a business (McGee et al., 2009). There is a solid body of evidence that demonstrates that entrepreneurial self-efficacy is a stronger predictor of entrepreneurial intentions (Newman et al., 2019; Zhao et al., 2005). More recently, however, a rise in the amount of scholarship has been in favor of integrative approaches, to the extent to which different theoretical traditions can be used to better explain the multidimensional character of entrepreneurial intention formation (Fayolle & Linan, 2014; Lortie & Castogiovanni, 2015). The current research responds to this request by integrating personality (internal locus of control), learning (entrepreneurial learning), social support (mentoring), and cognitive (attitude, self-efficacy) dimensions to a unified conceptual model.

Entrepreneurial Intentions

Scholars widely regard entrepreneurial intention as the strongest and most proximate predictor of entrepreneurial behavior (Bird, 1988; Kautonen et al., 2015). As a reference to the conscious intention of an individual to establish a new business, it can be considered the cognitive disposition, which underlies the entrepreneurial action (Thompson, 2009). Entrepreneurial intention formation is a complex interplay of personal attributes, environmental factors and cognitive processes. The study of entrepreneurial intentions has expanded these last 20 years, and it has explored different populations of entrepreneurs, such as university students, employees and

nascent entrepreneurs (Fayolle & Linan, 2014). Of these groups, university students have been given special focus given the closeness to the career decision points and the possibility of educational intervention to influence their entrepreneurial paths (Pittaway and Cope, 2007). Research has continuously revealed that although a significant proportion of students express their interest in entrepreneurship, the extent of translating these intentions into ventures is comparatively low (Galloway and Brown, 2002). Entrepreneurial intentions measurement has significantly changed over time, and researchers have created more advanced tools to reflect the multi-dimensionality of the construct. Typical methods are single-item measures (Do you plan to start a business?), multi-item scales that measure multiple elements of entrepreneurial intention (Thompson, 2009), and behavioral measures, like business plan development or resource mobilization efforts (Kautonen et al., 2015). This research will use a multi-item scale that has undergone validation in order to assess entrepreneurial intentions of students comprehensively.

Internal Locus of Control

Rooted in Rotter's (1966) social learning theory, internal locus of control describes the degree to which individuals believe their own actions shape the events and outcomes they experience. Those who score high on this trait tend to attribute both their successes and failures to personal effort and capability, rather than crediting external forces like luck, fate, or the influence of others (Rotter, 1966). This disposition has been repeatedly connected to entrepreneurial behavior, given that entrepreneurship demands initiative, personal accountability, and resilience when confronted with setbacks. Rauch and Frese (2007) established a positive relationship between internal locus of control and both entrepreneurial intentions and outcomes, while Hmieleski and Baron (2008) found that entrepreneurs generally exhibit stronger internal locus of control than their non-entrepreneurial counterparts. Among university students specifically, those who feel a sense of agency over their own futures may be more inclined to perceive entrepreneurship as a manageable and attainable career path (Guerrero et al., 2008).

Entrepreneurial Learning

Entrepreneurial learning refers to the knowledge, skills, and competencies that individuals develop through formal education, structured training, and hands-on experiences tied to entrepreneurship (Pittaway & Thorpe, 2012). This concept acknowledges that entrepreneurial ability is not simply a fixed, innate quality it can be cultivated and strengthened through deliberate learning opportunities (Henry et al., 2005). Such learning may take place across a range of settings, including entrepreneurship courses, business plan competitions, internship placements, and exposure to entrepreneurial role models. The relationship between entrepreneurship education and students' entrepreneurial intentions has attracted considerable scholarly attention, albeit with inconsistent conclusions (Martin et al., 2013). Certain studies identify a positive influence of entrepreneurship education on intentions (Souitaris et al., 2007), while others argue that education more reliably builds entrepreneurial knowledge and competence than it directly shapes intentions (Oosterbeek et al., 2010). More recent meta-analytic work indicates that the impact of such education varies considerably depending on factors like teaching methodology, program depth, and the characteristics of individual learners (Bae et al., 2014).

Mentoring Support

Mentoring has long been recognized as a valuable developmental relationship that can facilitate career development and professional growth (Kram, 1985). In the entrepreneurship context, mentoring involves guidance, advice, and support provided by experienced entrepreneurs or business professionals to aspiring or nascent entrepreneurs (St-Jean & Audet, 2012). The perceived helpfulness of mentoring support can influence entrepreneurial intentions by providing practical

knowledge, emotional support, and access to valuable networks (Waters et al., 2002). St-Jean and Audet (2012) found that entrepreneurial mentoring contributes to both the development of entrepreneurial competencies and the formation of entrepreneurial intentions. Similarly, Gravois (2006) demonstrated that mentorship programs can significantly enhance students' confidence in their entrepreneurial abilities. The quality and perceived helpfulness of mentoring relationships may be particularly important in contexts where formal entrepreneurship support infrastructure is limited (St-Jean, 2012).

Attitude Toward Entrepreneurship

Entrepreneurial attitude captures the extent to which individuals view entrepreneurship favorably or unfavorably as a career path (Ajzen, 1991). As a core component of the Theory of Planned Behavior, it has repeatedly proven to be among the most reliable predictors of entrepreneurial intentions (Schlaegel & Koenig, 2014). When individuals hold a positive attitude toward entrepreneurship, they tend to perceive the prospect of starting a business as appealing — weighing benefits such as independence, financial gain, personal satisfaction, and social recognition. The significance of this attitude in shaping entrepreneurial intentions has been demonstrated across diverse cultural settings. Linan and Chen (2009), for instance, identified attitude as the dominant predictor of entrepreneurial intentions among university students in both Spain and Taiwan, while Moriano et al. (2012) documented its consistent influence on intentions across several European nations.

Social Norms

Ajzen (1991) uses the term "subjective norms" to describe the perceived social pressure that either encourages or discourages individuals from pursuing entrepreneurial activity. This dimension of entrepreneurial intent reflects the role of significant people in one's life — such as family, friends, peers, and community members in shaping whether or not someone considers starting a venture (Krueger et al., 2000). It encompasses not only what these individuals expect, but also how strongly one feels compelled to meet those expectations. The degree to which social norms shape entrepreneurial intentions is not uniform across societies. In collectivist cultures, where maintaining group harmony and honoring family expectations are deeply valued, social norms tend to carry greater weight in shaping career trajectories (Linan & Chen, 2009). Supporting this, Tkachev and Kolvereid (1999) demonstrated that social norms were meaningful predictors of entrepreneurial intent among students in Russia. That said, other studies suggest that social norms may play a comparatively limited role, with personal attitudes proving to be a stronger driver of entrepreneurial intentions than external social pressure (Autio et al., 2001).

Entrepreneurial Self-Efficacy

Rooted in Bandura's (1986) social cognitive theory, entrepreneurial self-efficacy captures how confident individuals feel in their ability to carry out the tasks and responsibilities inherent to entrepreneurship (McGee et al., 2009). It reflects personal beliefs across a range of entrepreneurial competencies — from spotting opportunities and gathering resources to managing risk and developing business plans. When this confidence is high, individuals are more likely to develop entrepreneurial intentions and eventually take entrepreneurial action. A growing body of literature consistently links entrepreneurial self-efficacy to entrepreneurial intentions. Zhao et al. (2005) found that self-efficacy was a meaningful predictor of entrepreneurial intentions among MBA students, while McGee et al. (2009) advanced the field by constructing and validating a multidimensional self-efficacy scale that revealed how distinct dimensions influence intentions in different ways. This evidence was further reinforced by Newman et al. (2019), whose meta-analysis of entrepreneurial intention antecedents reaffirmed self-efficacy's central role. Beyond its

direct influence, entrepreneurial self-efficacy may also shape how other factors in the entrepreneurial intention model operate. Those with greater self-efficacy tend to be more attuned to favorable attitudes and encouraging social norms, as their stronger sense of capability makes it easier to convert supportive conditions into concrete entrepreneurial pursuits (Boyd & Vozikis, 1994). This potential moderating function remains an area deserving deeper empirical exploration.

Conceptual Framework and Hypotheses

Based on the literature review presented above, this study proposes a comprehensive conceptual framework that integrates personality traits, learning experiences, mentoring support, cognitive factors, and self-efficacy to explain entrepreneurial intentions among university students in Pakistan. The framework positions attitude toward entrepreneurship and social norms as mediators between antecedent factors (internal locus of control, entrepreneurial learning, and perceived helpfulness of mentoring support) and entrepreneurial intentions. Additionally, entrepreneurial self-efficacy is conceptualized as both a direct predictor and a moderator of key relationships in the model.

Direct Effects

Internal locus of control is expected to positively influence entrepreneurial intentions through its effects on attitude and social norms. Individuals with higher internal locus of control are likely to develop more favorable attitudes toward entrepreneurship, as they perceive themselves as capable of controlling the outcomes of entrepreneurial activities (Rotter, 1966). Additionally, their confidence in personal agency may lead them to be less constrained by social pressures and more willing to deviate from conventional career paths. Entrepreneurial learning is hypothesized to enhance entrepreneurial intentions by improving students' knowledge, skills, and confidence related to entrepreneurship. Through entrepreneurship education and related experiences, students develop more positive attitudes toward entrepreneurship and may also experience shifts in their perceptions of social norms regarding entrepreneurship as a legitimate career option (Fayolle & Gailly, 2015). Perceived helpfulness of mentoring support is expected to facilitate entrepreneurial intentions by providing guidance, encouragement, and practical advice. Mentors can help students develop more positive attitudes toward entrepreneurship by sharing success stories and demystifying the entrepreneurial process. Additionally, the involvement of respected mentors may signal to students that entrepreneurship is socially valued and supported (St-Jean & Audet, 2012).

Mediating Effects

Attitude toward entrepreneurship and social norms are proposed as mediators in the conceptual framework. This mediational structure is consistent with the Theory of Planned Behavior, which positions attitudes and subjective norms as proximal determinants of intentions, influenced by more distal factors (Ajzen, 1991). By examining these mediation pathways, this study aims to better understand the mechanisms through which personality traits, learning experiences, and mentoring support influence entrepreneurial intentions.

Moderating Effects

Entrepreneurial self-efficacy is proposed to serve as a moderating variable in the relationship between attitude/social norms and entrepreneurial intentions. Drawing on social cognitive theory, self-efficacy shapes the way individuals perceive and process environmental signals and internal experiences (Bandura, 1986). Those who demonstrate higher levels of entrepreneurial self-efficacy are arguably more capable of converting favorable attitudes and supportive social norms into concrete entrepreneurial intentions, given that their confidence equips them to act upon these conducive circumstances (Boyd & Vozikis, 1994).

Drawing from the conceptual framework and theoretical foundations outlined above, the following hypotheses are advanced:

H1a: A stronger internal locus of control is associated with a more favorable attitude toward entrepreneurship.

H1b: A stronger internal locus of control positively shapes individuals' perceived social norms regarding entrepreneurship.

H2a: Greater engagement in entrepreneurial learning contributes positively to one's attitude toward entrepreneurship.

H2b: Greater engagement in entrepreneurial learning positively influences perceived social norms surrounding entrepreneurship.

H3a: Higher perceived helpfulness of mentoring support fosters a more positive attitude toward entrepreneurship.

H4b: Higher perceived helpfulness of mentoring support positively reinforces social norms conducive to entrepreneurship.

H5: A more positive attitude toward entrepreneurship significantly enhances entrepreneurial intentions.

H6: Favorable social norms serve as a positive predictor of entrepreneurial intentions.

H7a: Entrepreneurial self-efficacy moderates the attitude–entrepreneurial intention relationship, with the effect being amplified among individuals who possess higher levels of self-efficacy.

H7b: Entrepreneurial self-efficacy exerts a significant positive direct influence on entrepreneurial intentions.

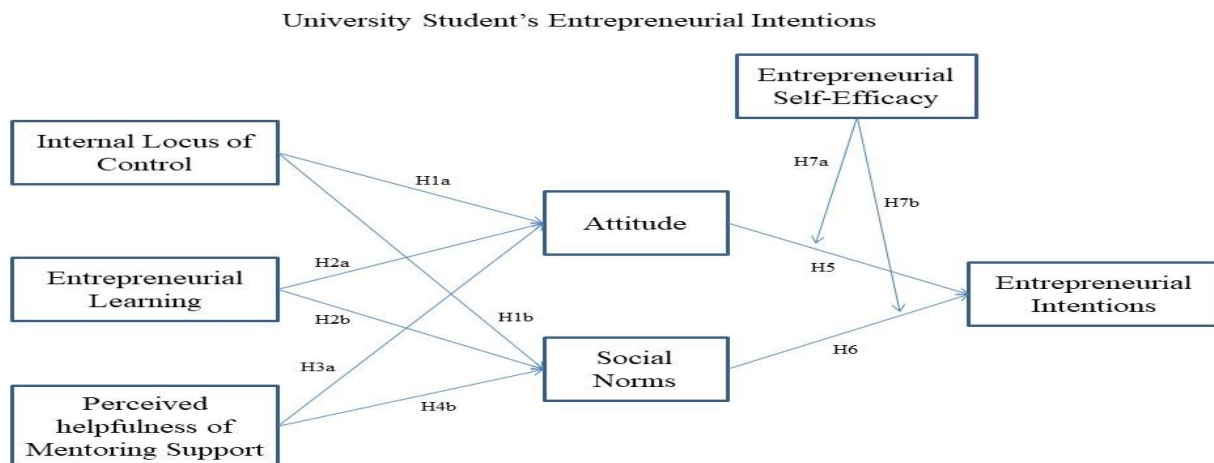


Fig 1: Conceptual Framework

Research Design

A quantitative, cross-sectional survey design was adopted for this study, as it is well-suited to exploring relationships among multiple constructs at a single point in time and evaluating the hypotheses drawn from the conceptual framework. A structured questionnaire was distributed to university students from diverse academic disciplines across Pakistan to gather the required data. The study was grounded in the positivist paradigm, which prioritizes objective measurement, hypothesis testing, and the generalizability of results (Creswell & Creswell, 2018). This philosophical stance aligns with the study's aim of empirically validating a theoretically derived conceptual model and establishing evidence for the proposed inter-variable relationships. The

selection of validated measurement instruments alongside robust statistical procedures further reinforces the positivist nature of this research.

Sampling and Data Collection

The study targeted undergraduate and graduate students enrolled at universities throughout Pakistan. To capture a broad range of institutional contexts, a multi-stage sampling strategy was adopted. In the first stage, four cities with notable university concentrations were chosen to represent distinct regions of the country: Karachi (Sindh), Lahore (Punjab), Islamabad (Capital Territory), and Peshawar (KPK). Each city encompasses both public and private universities. In the second stage, two universities per city were randomly selected, maintaining a balance between public and private institutions. In the third stage, purposive sampling guided the selection of students across multiple academic disciplines including business administration, engineering, computer science, and social sciences ensuring a diverse sample composed of students with likely familiarity with entrepreneurial concepts and opportunities. The data were gathered across three months, spanning October through December 2025. A total of 500 questionnaires were distributed, of which 428 were returned representing a response rate of 85.6%. Following the removal of incomplete and outlier responses, 412 questionnaires were deemed usable for analysis. This figure comfortably surpasses the threshold recommended for structural equation modeling, which stipulates a minimum of either 10 observations per indicator or 200 total observations (Hair et al., 2019). The demographic profile of the respondents is summarized in Table 1. The sample was broadly balanced by gender, with male respondents accounting for 54.4% and female respondents for 45.6%. Participants were drawn from multiple academic levels, with undergraduate students forming the slight majority at 58.3%. By field of study, business administration students constituted the largest share (42.2%), followed by engineering (23.5%) and computer science (18.4%). In terms of age, the majority of respondents (68.4%) fell within the 20–25 year bracket, a distribution consistent with typical university student demographics in Pakistan.

Table 1: Demographic Characteristics of Respondents (N = 412)

Characteristic	Frequency (n)	Percentage (%)
Gender		
Male	224	54.4
Female	188	45.6
Age Group		
18-20 years	98	23.8
21-23 years	182	44.2
24-26 years	100	24.3
Above 26 years	32	7.8
Academic Level		
Undergraduate	240	58.3
Graduate (Masters)	145	35.2
Graduate (MPhil/PhD)	27	6.6
Field of Study		
Business Administration	174	42.2
Engineering	97	23.5
Computer Science	76	18.4
Social Sciences	65	15.8

Measurements

All constructs in the conceptual framework were operationalized through well-validated scales drawn from existing literature, with slight modifications to suit the Pakistani context. The questionnaire was constructed in English, given its status as the primary medium of academic instruction across Pakistani universities. Unless otherwise indicated, all items were rated on a 5-point Likert scale, anchored at 1 (strongly disagree) and 5 (strongly agree). Entrepreneurial intentions were assessed via a 6-item scale adapted from Thompson (2009), capturing dimensions such as the likelihood of venture creation, intention timing, and degree of commitment to entrepreneurial pursuits. Representative items include: "I am ready to do anything to be an entrepreneur" and "I will make every effort to start and run my own business." Attitude toward entrepreneurship was gauged using a 5-item scale derived from Linan and Chen (2009), which evaluates how attractive entrepreneurship appears as a career path. A representative item reads: "Being an entrepreneur implies more advantages than disadvantages to me." Social norms were captured through a 4-item scale adapted from Linan and Chen (2009), reflecting the degree to which significant others endorse entrepreneurial pursuits. A representative item is: "My closest family members think that I should pursue an entrepreneurial career." Entrepreneurial self-efficacy was measured using an 8-item scale developed by McGee et al. (2009), assessing individuals' perceived competence across key entrepreneurial tasks, including opportunity identification, resource acquisition, and business planning. A representative item is: "I am confident in my ability to identify new business opportunities."

Internal locus of control was evaluated through a 6-item scale adapted from Rotter (1966), probing respondents' beliefs about the extent of personal agency over life outcomes. A representative item is: "My success depends on my own efforts rather than external factors." Entrepreneurial learning was measured using a 5-item scale constructed specifically for this study, reflecting exposure to entrepreneurship education and experiential learning. Items address participation in relevant coursework, workshops, competitions, and interactions with practicing entrepreneurs. Perceived helpfulness of mentoring support was assessed through a 4-item scale adapted from St-Jean and Audet (2012), examining the perceived quality and utility of mentoring relationships. A representative item is: "My mentor provides valuable advice for my entrepreneurial development."

Table 2 Summary of Measurement Items

Construct	Items	Source
Entrepreneurial Intentions	6	Thompson (2009)
Attitude toward Entrepreneurship	5	Linan & Chen (2009)
Social Norms	4	Linan & Chen (2009)
Entrepreneurial Self-Efficacy	8	McGee et al. (2009)
Internal Locus of Control	6	Rotter (1966)
Entrepreneurial Learning	5	Developed for this study
Mentoring Support	4	St-Jean & Audet (2012)

Data Analysis and Results

The analysis of the data was performed using SmartPLS 4.0 (Ringle et al., 2022), which is popularly known to conduct Partial Least Squares Structural Equation Modeling (PLS-SEM). The use of PLS-SEM was chosen over covariance-based SEM due to multiple factors: (1) the applicability to exploratory research with complex, multi-construct models (Hair et al., 2019); (2) the lack of multivariate normality conditions; (3) ability to use relatively small sample sizes; (4) its applicability to prediction-oriented research studies (Sarstedt et Two-stage analytic process as suggested by Hair et al. (2019) was embraced. The first step was to test the measurement model to

determine construct reliability and validity and to test the structural model to test the hypothetical relationship proposed. Mediation and moderation analyses were further performed to explore the more intricate relationships outlined in the conceptual framework.

Indicator Reliability

Indicator reliability was examined through the outer loadings of each item on its corresponding construct. Following the rules of Hair et al. (2019), the items with the outer loading lower than 0.708 were put on the list of possible dropouts, as they contribute less than half of the construct variance. Those that had loadings between 0.40 and 0.70, however, were retained as long as their omission did not significantly improve composite reliability. The present analysis revealed a high level of reliability in the indicators with all the indicators displaying higher outer loadings of 0.721-0.923, thus satisfying the required level of reliability in the indicators.

Internal Consistency Reliability

Internal consistency reliability was evaluated using both Cronbach's alpha and composite reliability (CR). Values of 0.70 or above for both metrics are generally regarded as acceptable (Nunnally & Bernstein, 1994), though values exceeding 0.95 are cautioned against as they may signal item redundancy (Hair et al., 2019).

Table 3 Reliability and Validity Assessment

Construct	Cronbach's α	Composite Reliability	AVE
Entrepreneurial Intentions	0.912	0.934	0.698
Attitude toward Entrepreneurship	0.856	0.893	0.623
Social Norms	0.823	0.876	0.587
Entrepreneurial Self-Efficacy	0.901	0.923	0.712
Internal Locus of Control	0.834	0.881	0.598
Entrepreneurial Learning	0.845	0.889	0.612
Mentoring Support	0.784	0.845	0.521

Table 3 shows that there were acceptable levels of internal consistency in all constructs. Cronbach alpha coefficients were between 0.784 and 0.912 with composite reliability values between 0.845 and 0.934, which is comfortably in the range of 0.70, the commonly accepted figure. These results indicate that measurement items are reliable and valid in measuring the constructs.

Convergent Validity

Convergent validity was evaluated through the Average Variance Extracted (AVE) for each construct. A value of AVE that is greater than 0.50 indicates that a construct contributes greater than half of the variance in the indicators of the construct, which, therefore, has satisfactory convergent validity (Fornell and Larcker, 1981). According to the results of Table 3, the values of AVE had a range between 0.521 and 0.712, and they were above the 0.50 mark. These results provide strong evidence that the constructs possess adequate convergent validity.

Discriminant Validity

Discriminant validity was assessed using the Fornell-Larcker criterion and the heterotrait-monotrait (HTMT) ratio. The Fornell-Larcker criterion requires that the square root of AVE for each construct should be greater than its correlations with other constructs (Fornell & Larcker, 1981). The HTMT ratio should be below 0.85 (Kline, 2011) or more conservatively below 0.90 (Gold et al., 2001). Table 4 presents the Fornell-Larcker criterion results. The square roots of AVE (shown on the diagonal in bold) are all greater than the corresponding inter-construct correlations

(shown off-diagonal), supporting discriminant validity. Additionally, all HTMT ratios were below 0.85, further confirming discriminant validity.

Table 4 Discriminant Validity - Fornell-Larcker Criterion

Construct	EI	AT	SN	ESE	ILC	EL	MS
EI	0.835						
ATT	0.456	0.789					
SN	0.398	0.423	0.766				
ESE	0.523	0.487	0.356	0.844			
ILC	0.312	0.398	0.345	0.412	0.773		
EL	0.387	0.456	0.398	0.445	0.378	0.782	
MS	0.298	0.412	0.287	0.356	0.298	0.387	

Collinearity Assessment

Prior to evaluating the structural model, collinearity among the predictor constructs was examined through the Variance Inflation Factor (VIF). According to Hair et al. (2019), VIF values not exceeding 5 reflect acceptable collinearity levels. All VIF values in the present analysis fell below 3.2, comfortably within the acceptable threshold, suggesting that collinearity does not pose a concern in the structural model.

Path Coefficients and Significance

The structural model was assessed by analyzing the path coefficients, their corresponding significance levels, and the coefficient of determination (R^2) for the endogenous constructs. To determine the statistical significance of the path coefficients, bootstrapping was conducted using 5,000 resamples.

Table 5 Path Analysis Results

Hypothesized Path	β	SE	t-value	Decision
H1a: ILC \rightarrow ATT	0.187	0.058	3.224	Supported
H1b: ILC \rightarrow SN	0.156	0.062	2.516	Supported
H2a: EL \rightarrow ATT	0.298	0.052	5.731	Supported
H2b: EL \rightarrow SN	0.245	0.055	4.455	Supported
H3a: MS \rightarrow ATT	0.212	0.061	3.475	Supported
H4b: MS \rightarrow SN	0.089	0.057	1.561	Not Supported
H5: ATT \rightarrow EI	0.423	0.048	8.813	Supported
H6: SN \rightarrow EI	0.198	0.052	3.808	Supported
H7b: ESE \rightarrow EI	0.312	0.046	6.783	Supported

Table 5 presents the path coefficients, standard errors, t-values, and significance levels for all hypothesized relationships. The results indicate that eight out of nine hypotheses are supported at the $p < 0.05$ level or better.

Coefficient of Determination (R^2)

The coefficient of determination (R^2) reflects how much of the variance in an endogenous construct is accounted for by its predictors. According to Hair et al. (2019), R^2 values of 0.25, 0.50, and 0.75 denote weak, moderate, and substantial explanatory power, respectively. In this study, the R^2 for entrepreneurial intentions stands at 0.587, meaning that approximately 58.7% of its variance is explained by the model — a level that falls between moderate and substantial. Similarly, the R^2

values for attitude (0.423) and social norms (0.356) both reflect moderate explanatory power for these mediating constructs.

Effect Size (f^2)

Effect size (f^2) measures how much influence each predictor construct exerts on the endogenous construct. Following Cohen's (1988) benchmarks, values of 0.02, 0.15, and 0.35 correspond to small, medium, and large effects, respectively. The findings indicate that attitude toward entrepreneurship exerts the largest effect on entrepreneurial intentions ($f^2 = 0.312$), followed by entrepreneurial self-efficacy ($f^2 = 0.198$, medium effect) and social norms ($f^2 = 0.087$, small to medium effect).

Predictive Relevance (Q^2)

Predictive relevance was evaluated using the cross-validated redundancy measure (Q^2) derived from blindfolding procedures. As established by Hair et al. (2019), any Q^2 value exceeding zero confirms predictive relevance. The Q^2 for entrepreneurial intentions was 0.423, demonstrating that the model possesses meaningful predictive relevance for this primary outcome variable.

Direct Effects

The results offer robust support for the proposed direct effects. Hypothesis H5, which predicted a positive relationship between attitude and entrepreneurial intentions, is strongly confirmed ($\beta = 0.423$, $p < 0.001$), consistent with prior literature and reinforcing attitude as the most influential predictor of entrepreneurial intentions in this sample. Hypothesis H6, which proposed a positive effect of social norms on entrepreneurial intentions, is likewise supported ($\beta = 0.198$, $p < 0.01$), albeit with a comparatively smaller effect size, suggesting that while social pressure shapes entrepreneurial intentions, individual evaluations of entrepreneurship carry greater weight. Hypothesis H7b, positing a direct positive effect of entrepreneurial self-efficacy on entrepreneurial intentions, is also strongly supported ($\beta = 0.312$, $p < 0.001$), affirming that students' belief in their entrepreneurial capabilities meaningfully drives their intention to venture into business.

Regarding antecedent variables, entrepreneurial learning demonstrates significant positive effects on both attitude (H2a: $\beta = 0.298$, $p < 0.001$) and social norms (H2b: $\beta = 0.245$, $p < 0.001$). Internal locus of control similarly shows significant influences on attitude (H1a: $\beta = 0.187$, $p < 0.01$) and social norms (H1b: $\beta = 0.156$, $p < 0.05$). In contrast, perceived helpfulness of mentoring support yields a significant effect on attitude alone (H3a: $\beta = 0.212$, $p < 0.01$), with no significant effect observed on social norms (H4b: $\beta = 0.089$, $p = 0.124$).

Mediation Analysis

Mediation analysis was conducted to examine the indirect effects of the antecedent variables on entrepreneurial intentions through attitude and social norms. The analysis used bootstrapping with 5,000 resamples to assess the significance of indirect effects.

Table 6 Mediation Analysis Results

Indirect Effect	β	SE	t-value	Result
ILC → ATT → EI	0.079	0.024	3.292	Significant
ILC → SN → EI	0.031	0.013	2.385	Significant
EL → ATT → EI	0.126	0.026	4.846	Significant
EL → SN → EI	0.048	0.019	2.526	Significant
MS → ATT → EI	0.090	0.025	3.600	Significant
MS → SN → EI	0.018	0.012	1.500	Not Significant

The mediation analysis findings are reported in Table 6. Entrepreneurial learning exerts significant indirect effects on entrepreneurial intentions via attitude ($\beta = 0.126$, $p < 0.001$) and social norms ($\beta = 0.048$, $p < 0.05$), confirming partial mediation. Likewise, internal locus of control demonstrates significant indirect effects through both attitude ($\beta = 0.079$, $p < 0.01$) and social norms ($\beta = 0.031$, $p < 0.05$). In contrast, the perceived helpfulness of mentoring support yields a significant indirect effect exclusively through attitude ($\beta = 0.090$, $p < 0.01$).

Moderation Analysis

To test hypothesis H7a — which posits that entrepreneurial self-efficacy moderates the relationship between attitude and entrepreneurial intentions — a moderation analysis was performed using the product indicator approach in SmartPLS, with bootstrapping employed to evaluate the significance of the interaction effect. The findings provide support for H7a ($\beta = 0.156$, $p < 0.01$), confirming that entrepreneurial self-efficacy positively moderates the attitude–intentions relationship. Specifically, the influence of attitude on entrepreneurial intentions is amplified among students who exhibit higher levels of entrepreneurial self-efficacy.

Discussion

This study set out to investigate the determinants of entrepreneurial intentions among university students in Pakistan, integrating insights from personality psychology, learning theory, and social cognitive theory within a comprehensive conceptual framework. The results offer valuable understanding of the complicated mechanisms whereby individual traits, educational encounters, and social impacts determine entrepreneurial desires in students. The most notable conclusion of this research is that the attitude towards entrepreneurship is the most influential predictor of entrepreneurial intentions. Attitude is the best predictor since it has a standardized path coefficient of 0.423 and it explains a significant percentage of the variance in intentions. This observation confirms the Theory of Planned Behavior and the meta-analytic results of the previous studies (Schlaegel and Koenig, 2014), which support the significance of positive perceptions of entrepreneurship in students. The high influence of attitude indicates that the focus of interventions to boost entrepreneurial intentions should be on altering the perceptions and assessment of entrepreneurship as a career choice among the students. This may include introducing the students to successful entrepreneurs, discussing the advantages of entrepreneurship (autonomy, financial gains, social change), and countering some of the prevalent myths about risks and difficulties of starting a business. The second most significant predictor of entrepreneurial intentions is the emergence of entrepreneurial self-efficacy, which not only has a direct impact but also moderates the attitude-intentions relationship. The discovery highlights the need to instill confidence in students regarding their entrepreneurial abilities. The moderating effect is especially important, because it implies that even those students who have positive attitudes towards entrepreneurship might not be able to convert them into intentions in case they do not feel confident in their potential. The strong impacts of entrepreneurial learning on attitude and social norms underscore the strong role of entrepreneurship education in influencing entrepreneurial orientations of students. The confirmation of this result substantiates the further investment in the educational entrepreneurship programs and implies that the educational programs may produce various positive effects not only in terms of direct skills training. The implications on social norms are also very interesting, which implies that entrepreneurship education can be used to normalize entrepreneurship as a valid and desirable profession. The role of personality traits in the entrepreneurial process can be supported by the finding that internal locus of control affects entrepreneurial intentions by influencing attitude and social norms. Students who think that they can affect the outcomes seem to develop more positive attitudes towards entrepreneurship and even less bound by social pressures. It indicates that the intervention of personality development

may be used to supplement the learnings of entrepreneurship. The lesser and not significant influence of perceived helpfulness of mentoring support on social norms (H4b) indicate that the work of mentoring might affect the social norms not so much by altering the perceptions of the social expectations but by the impact of the mentoring on individual attitudes. This could reflect the personal nature of mentoring relationships, which may be perceived as individual support rather than indicative of broader social norms.

Theoretical Contributions

This study makes several important contributions to the entrepreneurship literature. First, it offers empirical evidence based on the context of Pakistan, which is under-researched, but will provide specific insights on entrepreneurship in emerging economies. The results indicate that the theoretical connections developed in Western settings are mostly applicable to the Pakistani setting, which contributes to the cross-cultural applicability of the Theory of Planned Behavior and its derivatives. Second, the research is a synthesis of various theoretical views into a holistic approach, which gives a more holistic view of the formation of entrepreneurial intention. The analysis of personality traits, learning experiences, mentoring support, and cognitive aspects in one model shows the relative significance of each of them and the interrelations among them. Third, the study provides evidence for the mediating roles of attitude and social norms, helping to explain the mechanisms through which distal factors influence entrepreneurial intentions. Such a mediation point of view provides a more sophisticated insight into the process of entrepreneurial intention formation, as compared to direct-effects-only models. Fourth, the research indicates the moderating effect of entrepreneurial self-efficacy that indicates that intentions are translated into actions based on how confident people are in their abilities. The results have implications on the application of social cognitive theory in entrepreneurship studies and the need to acknowledge the impact of interaction in entrepreneurial intention theories.

Practical Implications

The findings of this study have several practical implications for educators, policymakers, and entrepreneurship support organizations. The high impact of the attitude implies that besides skill development, entrepreneurship education needs to be proactive in influencing the students on their attitudes and judgment towards entrepreneurship. This may mean the addition of more experiential learning methods, the use of successful entrepreneurs as guest speakers, and the ability of the students to work on actual entrepreneurial projects. The significance of entrepreneurial self-efficacy implies that the programs should have elements that are directly aimed at developing confidence in students in their entrepreneurial skills. This could involve progressive skill-building activities, mentorship opportunities, and supportive feedback mechanisms that help students develop a sense of mastery over entrepreneurial tasks.

For policymakers, the findings support the continued investment in entrepreneurship education at the university level. The fact that entrepreneurial learning positively influences attitudes and social norms implies that these investments can have far-reaching positive implications on the entrepreneurial culture of the youth. Moreover, the effectiveness of the entrepreneurship education activities can be improved with the help of policies that help to establish mentorship between experienced entrepreneurs and students. To the entrepreneurship support organizations, the results point out the need to work on both the attitudes and the self-efficacy in their programs. The programs that are based on skill development alone can be missing chances to affect the more proximal determinants of entrepreneurial intentions. Existing programs may be improved through the inclusion of attitude-shaping elements and confidence-building exercises.

Limitations and Future Research

Several limitations of this study warrant acknowledgment. First, its cross-sectional design restricts causal interpretation. Although the theoretical framework implies directional relationships, the data alone cannot confirm causation. Longitudinal or experimental designs in future studies would offer more robust causal evidence. Second, reliance on self-reported entrepreneurial intentions is a notable constraint, as intentions do not always translate into behavior. Given the well-established intention-behavior gap in the entrepreneurship literature, subsequent research should investigate whether the observed relationships extend to actual venture creation. Third, restricting the sample to university students in Pakistan raises concerns about generalizability. Researchers should test the proposed relationships across non-student populations and diverse cultural and institutional settings to assess broader applicability. Fourth, the model does not capture all potentially relevant antecedents of entrepreneurial intentions. Variables such as entrepreneurial passion, risk propensity, and resource accessibility were outside the scope of this study but could meaningfully enrich the framework in future work. Finally, by concentrating on intentions rather than behavior, the study leaves open the question of real-world impact. Future research should determine whether the relationships identified here ultimately manifest in venture creation and influence business performance outcomes.

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