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Paving the way of entrepreneurship for university students: the role of innovativeness, technological adaptability, and self-management, with risk-taking and family support as moderator

Md. Abu Issa Gazi[a,b], Anika Tasnim Mim[c], Abdullah Al Masud[c], Md. Kazi Hafizur Rahman[c], Mohammad Bin Amin[d], Abdul Rahman bin S Senathirajah[a] and Judit Oláh[d,e*]

[a]Faculty of Business and Communications, INTI International University, Nilai, Negeri Sembilan, Malaysia; [b]School of Management, Jiujiang University, Jiujiang, China; [c]Department of Management Studies, University of Barishal, Barishal, Bangladesh; [d]Faculty of Economics and Business, University of Debrecen, Debrecen, Hungary; [e]Doctoral School of Management and Business Administration, John von Neumann University, Kecskemét, Hungary

ABSTRACT

This study aims to examine how entrepreneurial education (EE), innovativeness (INT), technological adaptability (TA), and self-management (SM) shape the risk-taking behavior (RTB) and intention to become entrepreneurs of university students. Additionally, it intends to explore the influence of risk-taking behavior (RTB) as a mediator and family support (FS) as a moderator. This study utilized a quantitative methodology to gather data from a cohort of 396 university students. The data was collected by a survey questionnaire that employed a seven-point Likert scale. The sampling method used was convenience sampling. We utilized structural equation modeling (SEM) to examine and interpret the data. The findings demonstrated a direct relationship between each independent variable and risk-taking behavior as well as entrepreneurial intentions. The proposed variable and entrepreneurial intentions are significantly mediated by risk-taking behavior. Furthermore, there is a favorable correlation between risk-taking behavior and entrepreneurial intention when family support is present. This study covers literature gaps on entrepreneurial intentions by thoroughly investigating interconnected variables including self-management, innovativeness, technological adaptability, risk-taking behavior, and entrepreneurial intentions. The study evaluates the impact of these determinants, explores risk-taking behavior as a possible mediator, and explores the moderating effects of family support.

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1. Introduction

Entrepreneurship is the act of initiating and managing a new business venture, usually involving the willingness to take financial risks to achieve financial gain and expansion. (Bonfanti et al., 2024). The pursuit of entrepreneurship among university graduates holds paramount significance, influencing individuals, communities, and economies on various fronts. Entrepreneurship acts as a catalyst for both economic development (Amorós et al., 2021; Porfírio et al., 2023) and sustainable development (Bouncken et al., 2022; Porfírio et al., 2023). Examples of entrepreneurial contributions include invention, innovation in products and processes, and the creation of jobs (Cheng et al., 2024; Gazi et al., 2024). Because it is linked with self-employment, entrepreneurship is seen as an effective and prospective method to alleviate difficulties like employability, particularly among the youth. (Al-Mamary & Alraja, 2022). The term 'entrepreneurs' refers to 'economic growth engines' in

CONTACT Md. Abu Issa Gazi dr.issa@jju.edu.cn School of Management, Jiujiang University, Jiujiang, China; Abdullah Al Masud aamasud@bu.ac.bd Department of Management Studies, University of Barishal, Bangladesh; Mohammad Bin Amin binaminbd@mailbox.unideb.hu Faculty of Economics and Business, University of Debrecen, Debrecen, Hungary
*Present address: Department of Trade and Finance, Faculty of Economics and Management, Czech University of Life Sciences Prague, Czech Republic.

the corporate realm (Kadiyono & Sulistiobudi, 2024; Anjum et al., 2023). They possess the ability to significantly and favorably impact their nation's social and economic growth if used appropriately. Notable accomplishments include creating new job possibilities and developing innovative products and industrial processes (Al-Mamary & Alraja, 2022). Every year, a significant number of students complete their studies at colleges and universities. However, only a few of them have the ambition to start their businesses, while the rest opt to find jobs where they are compensated (Porfírio et al., 2023). New graduates, the public, and the government are concerned about the situation. One way to survive without wage labor is self-employment (Gazi et al., 2024; Gabrielsson et al., 2020).

Entrepreneurship research has undergone significant expansion and advancement over the last forty years, resulting in increased academic acknowledgment (Gazi et al., 2024; Thurik et al., 2023). The top entrepreneurship journals are receiving more submissions from more countries, and their citation impact factors are rising. Nine entrepreneurial journals made the Social Sciences Citation Index (SSCI) top 100 business and management journals for 2021 impact factors (Thurik et al., 2023). Research on entrepreneurial intention and entrepreneurship is crucial for understanding the motivations behind individuals choosing entrepreneurship (Porfírio et al., 2023). It helps predict and influence entrepreneurial behavior, informs the development of education and training programs, guides policy development for a conducive entrepreneurial environment, and contributes to economic development (Lumpkin & Dess, 1996; Gazi et al., 2024). This study aims to examine recent university graduates' entrepreneurship aspirations, taking family support and failure risk into account. It also aims to examine innovativeness, entrepreneurial education, technological adaptability, self-management, and risk-taking behavior to understand how they affect entrepreneurs' intentions.

The literature on entrepreneurial intentions has identified several gaps that warrant empirical investigation. Firstly, existing studies have often evaluated relevant variables in isolation, lacking a comprehensive exploration of their interconnectedness. Secondly, to the best of the author's knowledge and understanding, this is the first study to investigate the impact of self-management on risk-taking behavior and entrepreneurial intentions. Third, researchers rarely study the influence of technological adaptability and innovation on proposed variables. In addition, there is a lack of research that examines how risk-taking behavior influences the link between these characteristics and entrepreneurial goals, especially among university students. Lastly, the association between risk-taking behavior and entrepreneurial goals has not been extensively studied in terms of the moderating influence of family support. By addressing these factors, this study aims to provide insights that can inform educational curricula, support systems, and policy initiatives, ultimately fostering a more conducive environment for entrepreneurship. The study tries to find answers to the following questions: **RQ1:** Does self-management encourage entrepreneurial intentions and risk-taking behavior? **RQ2:** Does innovativeness influence risk-taking behavior and entrepreneurial intentions? **RQ3:** Does entrepreneurial education influence risk-taking behavior and entrepreneurial intentions? **RQ4:** Whether risk-taking behavior has a mediating effect in our model or not? **RQ5:** Does family support moderate the relationship between risk-taking behavior and entrepreneurial intentions?

The novelty of this study lies in its several unique contributions to the literature on entrepreneurial intentions, particularly within the Bangladeshi context. It is the first to examine the impact of self-management on risk-taking behavior and entrepreneurial intentions, while also integrating technological adaptability and innovation as critical but underexplored factors. By adopting a mediated-moderated approach, the research investigates how risk-taking behavior mediates these relationships and how family support moderates the link between risk-taking and entrepreneurial goals. Contextually grounded in Bangladesh, a developing nation with a burgeoning entrepreneurial ecosystem, the study focuses on university students, demographic often facing unique socio-economic and cultural constraints. This research aims to provide actionable insights to inform educational curricula, support systems, and policy initiatives, fostering a more conducive environment for entrepreneurship in Bangladesh and other similar developing economies. The findings can help policymakers build entrepreneurship-focused policies. Teachers can improve entrepreneurship education programs to educate pupils better. Aspiring entrepreneurs can decide better. Research may also stimulate economic growth. Risk-taking and family support

enrich literature by providing a holistic vision. This improves theories and guides future research in entrepreneurship.

2. Literature review and hypothesis development

2.1. Theoretical framework

This study utilizes theoretical frameworks such as the Theory of Planned Behavior (Ajzen, 1991) and the Social Cognitive Theory (Bandura, 1986). The Theory of Planned Behavior posits that attitudes, subjective norms, and perceived behavioral control collectively influence intentions and behavior (Ajzen, 1991). In the context of entrepreneurial intentions, this theory helps frame the interplay of individual beliefs and social influences (Gazi et al., 2024). Additionally, the Social Cognitive Theory emphasizes the role of observational learning, self-efficacy, and environmental factors in shaping behavior (Bandura, 1986). These theoretical frameworks guide the investigation of how personal beliefs, social influences, and environmental factors influence entrepreneurial intentions (Vinzi et al., 2010).

In this study, innovation, aligned with both theories, reflects individuals' inclination towards innovative thinking and action, impacting attitudes, and self-efficacy. Entrepreneurial education is expected to enhance subjective norms and self-efficacy by facilitating knowledge acquisition and skill development. Similarly, technology adaptability, consistent with Social Cognitive Theory, influences self-efficacy and behavioral control by enabling mastery of technological tools. Self-management, rooted in both theories, is crucial for instilling a sense of control over actions and decisions, thus augmenting perceived behavioral control. The moderator, family support, is proposed to interact with these variables, amplifying their effects on entrepreneurial intentions by fostering a supportive environment and bolstering self-efficacy and perceived behavioral control. Ultimately, entrepreneurial intention and risk-taking behavior are anticipated outcomes resulting from the interplay among these variables and theoretical frameworks.

2.2. Innovativeness (INT)

Innovativeness refers to the ability or tendency to generate new and creative ideas, and to apply them in practical ways (Huang et al., 2022). It involves identifying opportunities and finding novel ways to solve problems or meet market demands. When individuals engage in innovative thinking, it sparks their entrepreneurial intention (Shahzad et al., 2021). This is because innovation often uncovers unmet needs, untapped markets, or potential improvements in existing products or services, which in turn creates opportunities for entrepreneurial ventures (Huang et al., 2022; Park, 2017). Innovativeness drives individuals to envision and pursue new business ideas, leading to a higher entrepreneurial intention (Wathanakom et al., 2020). The desire to bring innovative solutions to the market motivates individuals to start their businesses and embark on entrepreneurial journeys. On the other hand, innovativeness inherently involves risk-taking (Putniņš & Sauka, 2020). It necessitates individuals to venture beyond their comfort zones, question established standards, and explore novel ideas (Huang et al., 2022; Wathanakom et al., 2020). Entrepreneurship, as a venture characterized by uncertainty, also involves taking risks (Porfírio et al., 2023). Innovators understand that to introduce new products or services, they need to take calculated risks to overcome obstacles, secure resources, and capture market opportunities (Appendix). Thus, we suggest the following hypotheses:

H1: Innovativeness Positively Influence Entrepreneurial Intention.

H2: Innovativeness Positively Influence Risk-Taking Behavior.

2.3. Entrepreneurial education (EE)

Entrepreneurship education is a structured educational program that focuses on instructing students in the essential skills and attitudes required for entrepreneurship (Adu et al., 2020; Anubhav et al., 2024; Gazi et al., 2024). The key objective is to enhance students' comprehension of entrepreneurship, develop their entrepreneurial competencies, and promote an entrepreneurial culture and mentality at personal,

societal, and community levels (Porfírio et al., 2023; Uddin et al., 2022). When people participate in specialized educational programs focused on entrepreneurship, they acquire crucial knowledge and skills essential for turning their business ideas into reality (Gazi et al., 2024). This newfound understanding not only boosts their confidence but also fuels their desire to become successful entrepreneurs (Adu et al., 2020; Shahzad et al., 2021). Moreover, educational initiatives emphasize the importance of understanding and managing risks effectively, encouraging individuals to take calculated chances rather than being paralyzed by fear of failure (Cheng et al., 2024; Shahzad et al., 2021). By instilling this balanced perspective, entrepreneurial education helps aspiring entrepreneurs make informed decisions and fosters a supportive environment for innovation and success in the business world (Gazi et al., 2024). So, we proposed the following hypothesis,

H3: Entrepreneurial Education Positively Influence Entrepreneurial Intention.

H4: Entrepreneurial Education Positively Influences Risk-Taking Behavior.

2.4. Technological adaptability (TA)

Technology adaptability refers to how well individuals can embrace and integrate new technologies into their operations (Rubel et al., 2020; Soluk et al., 2021). It's no secret that technology plays a crucial role in modern entrepreneurship, and those who are adaptable in this area are more likely to see the potential of technological advancements in driving their business ideas forward (Mohammed, 2019; Shahzad et al., 2021). Moreover, being technologically adaptable allows entrepreneurs to effectively navigate the risks that come with adopting new technologies (Soluk et al., 2021). Embracing change and being open to innovative tools and platforms reduces the fear and uncertainty surrounding technological advancements (Huang et al., 2022; Park, 2017). They see these risks as opportunities rather than obstacles, as they understand that embracing new technologies can lead to enhanced efficiency, better customer experiences, cost savings, and increased market share.

H5: Technology adaptability Positively Influence Entrepreneurial Intention.

H6: Technology adaptability Positively Influences Risk-Taking Behavior.

2.5. Self-management (SE)

Self-management encompasses the systematic approach through which personnel establish objectives, execute constructive actions, and participate in a sequence of conduct, such as self-assessment and appraisal, reprisal, and penalization, to foster their inherent value by their requirements (Yu et al., 2022). For aspiring entrepreneurs, being adept at self-management is crucial as it allows them to stay focused, organized, and committed to their goals. The ability to effectively regulate actions, emotions (Othman et al., 2020), and time contributes to entrepreneurs' drive and commitment toward their venture, enhancing their entrepreneurial intention. Furthermore, the practice of self-management empowers individuals to exercise improved control over their impulses and emotions, resulting in a more measured approach to risk-taking (Duckworth et al., 2024; Yu et al., 2022). By cultivating self-discipline and emotional regulation, entrepreneurs can make well-informed decisions, carefully weighing the potential risks and rewards associated with their actions.

H7: Self-Management Positively Influence Entrepreneurial Intention.

H8: Self-Management Positively Influence Risk-Taking Behavior.

2.6. Mediating role of risk-taking behavior (RTB)

An individual's risk-taking propensity is a significant personality attribute that plays a crucial role in project selection and decision-making within entrepreneurship (Murad et al., 2024; Sharaf et al., 2018). The capacity for risk-taking enables entrepreneurs to maintain an ongoing process of open innovation and promote competitiveness (Adu et al., 2020; Shahzad et al., 2021). Entrepreneurs possess the ability to

respond effectively in situations of uncertainty, even when they have made erroneous assessments of the risks connected with certain business operations (Gazi et al., 2024). A correct evaluation of the risk-return relationship results in fewer errors and enhances corporate strategies to attain the objective of maintaining confidentiality (Butt et al., 2015; Shahzad et al., 2021). Additionally, it assists entrepreneurs in selecting open business models. Independence is a crucial factor in the decision-making process of entrepreneurs and is also a driving force behind entrepreneurial aims. Furthermore, the inclination to engage in risky behavior enhances self-assurance and can impact one's capacity to participate in the process of making decisions. It boosts an individual's inclination towards entrepreneurship, and their experiences are transformed into innovative thinking, which results in the making of daring decisions to attain entrepreneurial success (Gazi et al., 2024; Mittal & Raghuvaran, 2021). Entrepreneurs possess greater self-assurance compared to non-entrepreneurs due to their enhanced capacity to undertake risks to attain success (Vinzi et al., 2010; Yu et al., 2022). Hence, engaging in ventures that involve risk serves as a reflection of an entrepreneur's reputation, whether it is esteemed, moderate, or low, thereby enhancing the likelihood of their achievements.

H9: Risk-taking behavior positively mediates the relationship between Entrepreneurial Intention and the suggested variables.

2.7. Moderating role of family support (FS)

The assertion that entrepreneurs are risk-takers is widely acknowledged in the literature (Ashari et al., 2021). However, the level of risk tolerance in individuals can be influenced by multiple factors, including the level of support they receive from their families (Georgescu & Herman, 2020). Supportive family environments can foster a sense of confidence, providing encouragement and a safety net that allows entrepreneurs to feel more secure in taking risks (Ashari et al., 2021). When entrepreneurs know they have the backing of their family, they may be more willing to take calculated risks, as they have emotional and financial support in case of setbacks (Georgescu & Herman, 2020).

H10: Family Support moderates the relationship between Risk Taking Behavior and Entrepreneurial Intention.

We proposed the following framework from the literature review and discussion (Figure 1).

3. Research methodology

3.1. Data collection, research design, and sampling

The current study utilized a stratified random sampling approach to collect data from Bangladeshi university students. Stratified random sampling entails separating a population into homogenous subgroups

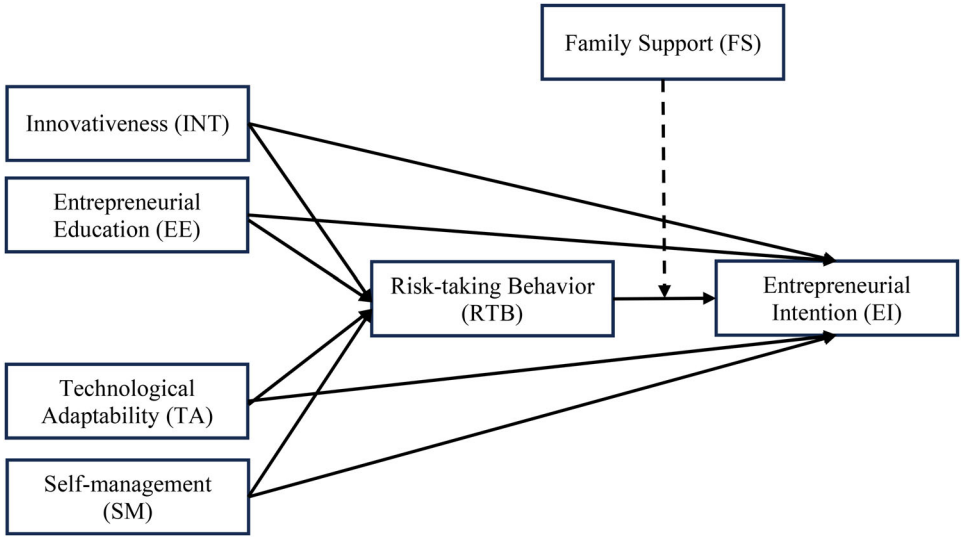

Figure 1. Conceptual framework. *Source:* Authors own creation.

(strata) based on shared features, calculating the sample size for each stratum (proportional or equal), and randomly selecting participants from each stratum. The population of Bangladeshi university students was stratified based on two main criteria: academic level and field of study. A proportional allocation method was employed to ensure that the sample represented each subgroup in accordance with the overall distribution of students at universities across Bangladesh. The survey questionnaire was constructed in three parts using field research. After a thorough literature review, questionnaire items were chosen. After that, a focus group study was undertaken with four prominent entrepreneurship and business researchers and examined to improve questionnaire clarity, comprehensibility, redundancy, and symmetrical lucidity. Following this, a pilot study was conducted with a randomly selected sample of 25 individuals to assess the relevance and adequacy of the measurement questions. Reliability testing was conducted by comparing the Cronbach's Alpha coefficient, with a cutoff value of 0.70, for each construct. While most results met satisfactory standards, a few exceptions were noted. Before finalization, a few adjustments were made to improve the questionnaire's readability and clarity. The final survey contained two parts. The first section outlined the research goals, promised participants their responses would be anonymous, and collected demographic data. The second section aimed to assess participants' perspectives on the suggested variables through a total of 35 questions, with each construct comprising 5 questions. The study period commenced on November 10th, 2023, and concluded on 11th December, 2023. We disseminated the survey through multiple channels, including Facebook, Messenger, WhatsApp, email, and other social media platforms. We collected a total of 420 responses. After conducting a thorough examination to identify any instances of missing data and duplicated responses, we selected and kept 396 responses for our final data analysis.

3.2. Instrument design

Measurement items for INT were drawn from previous research studies (Elshaer & Sobaih, 2022; Huang et al., 2022), while those for EE were adopted from Aga (2023). Items for TA were sourced from Parasuraman and Colby (2015) and Hamid (2022), while those for SM were obtained from Yu et al. (2022) and Renn et al. (2011). Likewise, items for RTB variables were derived from Elshaer and Sobaih (2022), and those for FM were sourced from Lingappa et al. (2020) and Wardana et al. (2020). Lastly, items for EI were adapted from Ahmed et al. (2017) and Miralles et al. (2016). All questions were presented on a seven-point Likert scale, ranging from '1' indicating 'strongly disagree' to '7' indicating 'strongly agree.' (see Appendix).

3.3. Common method variance (CMV)

This study conducted a CMV test using Harman's single-factor test methodology. According to Podsakoff et al., 2003), CMV difficulties occur when either all the items fall under the same factor or when one factor explains more than 50% of the variation. The test results indicate that the initial component accounts for 32.372% of the overall variance, and only a small number of factors have an eigenvalue exceeding 1, suggesting that the data is not affected by common method variance (CMV) issues (Masud et al., 2024; Podsakoff et al., 2003).

3.4. Overview of analyses

The study used three data analysis methods. To assess concept reliability, validity, multicollinearity, and common method variance, exploratory and confirmatory factor analysis (EFA and CFA) were used. Second, measurement and structural models' data representativeness was assessed using well-established fit indices. Finally, AMOS (version 24) was used for path analysis to test study hypotheses. SEM was recommended for its capacity to predict model exogenous variables, show construct associations, and predict strongly (Anderson and Gerbing, 1988; Gazi et al., 2024).

Table 1. Demographic characteristics ($n = 396$).

Demographics	Frequency	%	Cumulative%
Gender			
Male	182	46.0	46.0
Female	214	54.0	100.0
Marital status			
Single	310	78.3	21.7
Married	86	21.7	100.0
Age			
18–20	60	15.2	15.2
21–25	323	81.6	96.7
26–30	9	2.3	99.0
Above 30	4	1.0	100.0
Level of education			
Under Graduate	292	73.7	73.7
Graduate	90	22.2	96.5
Post Graduate	11	2.8	99.2
PhD	9	.8	100.0
Types of educational institutions			
Public	381	96.2	96.2
Private	15	3.8	100.0

Table 2. Inter-item correlation matrix.

Construct	INT	TA	SM	EE	FS	RTB	EI
INT	**1.000**	.255	.235	.287	.251	.235	.284
TA	.255	**1.000**	.241	.248	.188	.231	.322
SM	.235	.241	**1.000**	.225	.181	.225	.279
EE	.287	.248	.225	**1.000**	.265	.244	.297
FS	.251	.188	.181	.265	**1.000**	.308	.349
RTB	.235	.231	.225	.244	.308	**1.000**	.420
EI	.284	.322	.279	.297	.349	.420	**1.000**

4. Analysis and result

4.1. Sample profile

Table 1 presents the demographic characteristics of the participants. The results show that out of the chosen sample, 46.0% are male while 54.0% are female. Single status stands as 78.3% and aged between 21 and 25 years whereas young participants representing a percentage of 81.6% are the dominant participants in this study and it needs to be mentioned that, Bangladesh's population is mostly made up of young people at present. In 2019, 36.2% of the country's 164.7 million people were under the age of 20, 54.3% were under the age of 30, and 70.4% were under the age of 40. Among them, 73.7% and 22.2% of the participants have a under graduate and a graduation degree, respectively.

4.2. Inter-item correlation matrix

In addition, Table 2 shows the correlation matrix between variables. Results show that EI has the largest positive link with RTB (0.420), second by FS (0.349), and TA (0.322). Table 2 also shows that all the correlation values between variables are within their critical limits, which represents there is no serious concern on multi-collinearity.

4.3. Measurement model analysis

Figure 2 depicts the measurement model, with its validity and reliability explained in Table 3.

The findings indicate that both Cronbach's alpha (Table 3) and CR scores surpass the recommended cutoff value of 0.70, ranging from 0.935 to 0.963, demonstrating strong internal consistency. AVE scores, which range from 0.788 to 0.871, also exceed the acceptable threshold of 0.50, and the factor loads range from 0.875 to 0.948 (Table 4), all surpassing the recommended cutoff of 0.70. Moreover, there exists both divergent and discriminant validity as the inter-construct correlation value is lower than the square root of the Average Variance Extracted (AVEs), as recommended by Hair et al. (2010) and Fornell

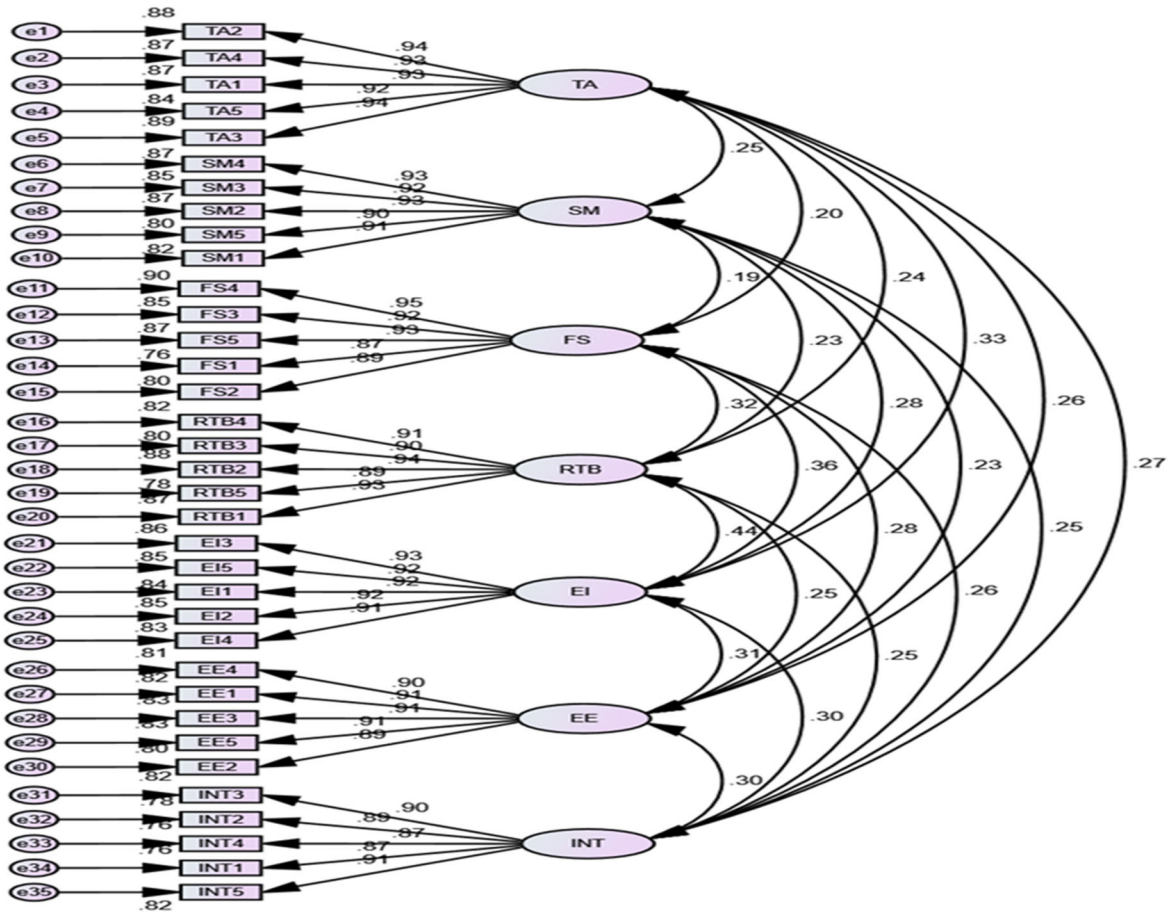

Figure 2. Measurement model.

and Larcker (1981). The VIF values, ranging from 1.045 to 1.152 (Table 4), demonstrate that the model does not display multicollinearity problems. To evaluate the overall model fit, various commonly utilized fit indices, including chi-square of degrees of freedom (X2/d > 3), CFI (>0.90), GFI (>0.85), AGFI (>0.80) and RMSEA (<0.05), were evaluated, and the model demonstrated good fit according to these criteria, see Table 4 (Hair et al., 2010; Hu & Bentler, 1999).

4.4. Structural model analysis

This study employs structural model analysis to assess the satisfaction of measurement models and investigate the theoretical relationships among the suggested variables. Table 5 indicates that the SEM model demonstrates satisfactory fit to the data, as evidenced by the following fit indices: X2/df = 1.648, AGFI = 0.887, GFI = 0.905, CFI = 0.981, TLI = 0.979, IFI = 0.965, RMSEA = 0.040, and Pclose = 0.997. The statistics indicate that the model accounted for 23% and 32% of the variability in entrepreneurial intention and risk-taking behavior, respectively, as measured by the R^2 value (Figure 3).

According to the study, hypotheses H1 and H2 suggest that creating an INT can benefit the prospects for both RTB and EI. The research found that a favorable INT was significantly associated with higher EI ($p = .016$) and increased RTB prospects ($p = .005$), supporting H1 and H2. Additionally, this investigation looked at the effects of EE on both EI and RTB (H3 and H4). The findings revealed that being exposed to EE had a constructive and noteworthy effect on EI ($p = .004$) and RTB ($p = .002$), supporting the validity of H3 and H4. Furthermore, hypotheses H5 and H6 investigated the effect of TA on EI and RTB. The research found that TA had a favorable and noteworthy impact on both EI ($p < 0.001$) and RTB prospects ($p = 0.005$), supporting H5 and H6. Finally, in hypotheses H7 and H8, the influence of SM on EI and RTB was investigated. The findings indicated a notable positive effect of SM on both EI ($p = .010$) and prospects for RTB ($p = .006$), thus confirming H7 and H8.

Table 3. Standardized regression weights.

Variable	Item	Loading	Estimate	S. E.	*T*-value	Cronbach's alpha
Innovativeness	INT1	.901	.871	.035	25.950	.949
	INT2	.923	.886	.034	26.964	
	INT3	.931	.904			
	INT4	.909	.872	.034	25.993	
	INT5	.892	.906	.033	28.526	
Entrepreneurial education	EE1	.932	.906	.034	28.711	.957
	EE2	.898	.893	.035	27.712	
	EE3	.929	.912	.036	29.215	
	EE4	.939	.903			
	EE5	.919	.909	.035	29.029	
Technology adoption	TA1	.946	.934	.024	36.437	.970
	TA2	.959	.938			
	TA3	.942	.942	.027	37.725	
	TA4	.947	.934	.028	36.550	
	TA5	.945	.919	.026	34.290	
Self-management	SM1	.907	.908	.028	32.169	.970
	SM2	.941	.932	.030	35.139	
	SM3	.954	.922	.030	33.855	
	SM4	.959	.933			
	SM5	.915	.897	.030	30.944	
Family support	FS1	.918	.870	.026	29.629	.962
	FS2	.909	.895	.027	32.437	
	FS3	.945	.921	.024	36.043	
	FS4	.966	.951			
	FS5	.925	.933	.026	38.044	
Risk taking behavior	RTB1	.891	.932	.033	31.643	.961
	RTB2	.945	.939	.033	32.366	
	RTB3	.951	.895	.033	28.326	
	RTB4	.955	.906			
	RTB5	.903	.886	.033	27.569	
Entrepreneurial intention	EI1	.941	.918	.031	32.573	.965
	EI2	.920	.925	.029	33.375	
	EI3	.963	.927			
	EI4	.886	.912	.031	31.901	
	EI5	.958	.921	.030	33.004	

Table 4. Reliability and validity statistics.

Construct	CR	AVE	MSV	MaxR(H)	TA	SM	FS	RTB	EI	EE	INT	VIF
TA	0.971	0.871	0.111	0.972	**0.933**							1.164
SM	0.964	0.844	0.081	0.965	0.249***	**0.919**						1.144
FS	0.962	0.836	0.127	0.967	0.195***	0.185***	**0.915**					1.189
RTB	0.961	0.831	0.192	0.963	0.242***	0.235***	0.318***	**0.912**				1.198
EI	0.965	0.847	0.192	0.965	0.333***	0.284***	0.357***	0.438***	**0.920**			
EE	0.957	0.818	0.095	0.958	0.256***	0.232***	0.276***	0.254***	0.308***	**0.904**		1.203
INT	0.949	0.788	0.092	0.950	0.267***	0.246***	0.265***	0.249***	0.296***	0.303***	**0.888**	1.200

Model fit indices: $X^2/df = 1.734$, GFI=.877, AGFI = 0.857, CFI=.976, TLI=.974, IFI = 0.976, NFI = 0.957, RMSEA = 0.043, PClose= 0.99.
Note: Bold diagonal values are the square root of the AVE value. Significance of Correlations: †$p < 0.100$; *$p < 0.050$; **$p < 0.010$; ***$p < 0.001$.

Table 5. Summary of the SEM results.

Hypotheses	Relationship			S. E	*T* value	*P* value	Decision
H1	EI	<—	INT	.044	2.420	.016	Supported
H2	RTB	<—	INT	.046	2.797	.005	Supported
H3	EI	<—	EE	.050	2.870	.004	Supported
H4	RTB	<—	EE	.051	3.036	.002	Supported
H5	EI	<—	TA	.041	3.800	.001	Supported
H6	RTB	<—	TA	.042	2.821	.005	Supported
H7	EI	<—	SM	.044	2.577	.010	Supported
H8	RTB	<—	SM	.045	2.775	.006	Supported

RTB: $R^2 = 32\%$; EI: $R^2 = 23\%$.
Model fit indices: $X^2/df = 2.061$, GFI = 0.846, AGFI = 0.824, CFI = 0.965, TLI = .962, IFI = 0.965, NFI = 0.935, RMSEA = 0.052, PClose = 0.237.

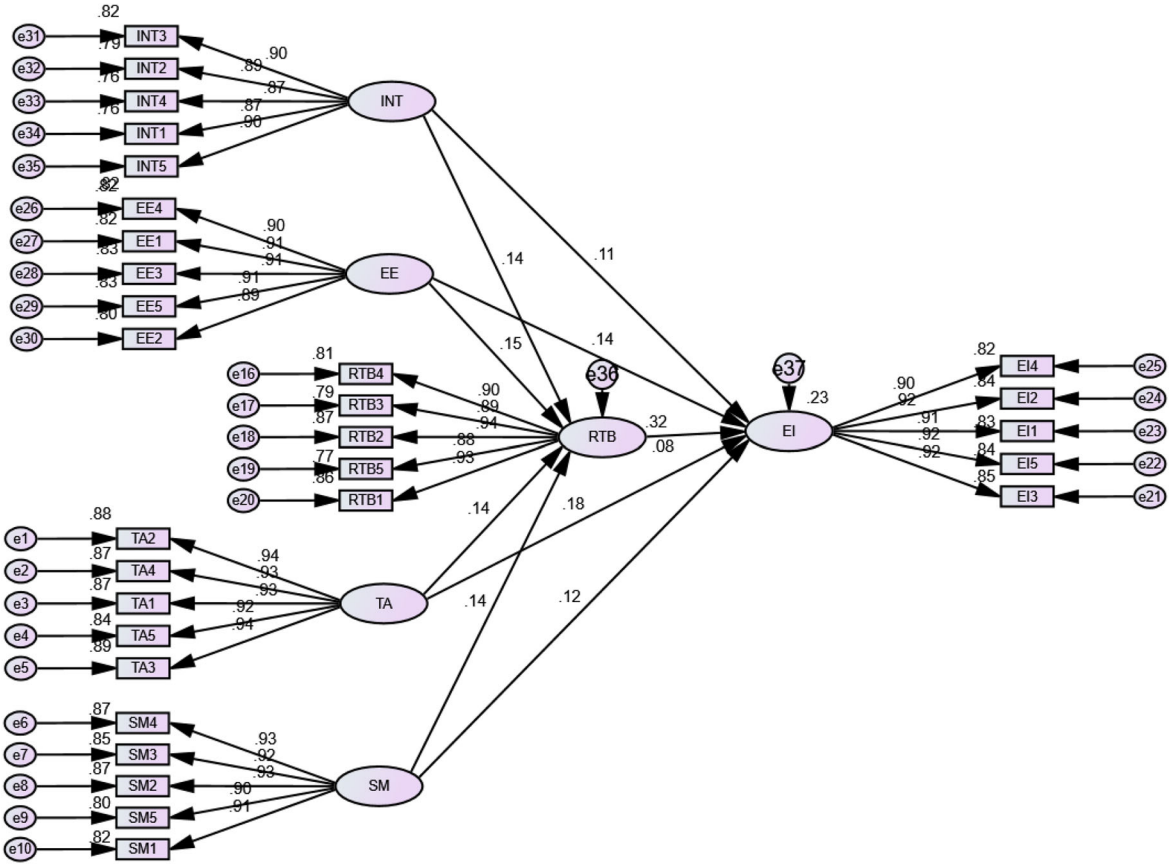

Figure 3. Structural equation model.

Table 6. Mediation model results.

		Bootstrapping		
		Bias-corrected		
		95% CI		
Variables Indirect effect	Estimate	Lower	Upper	*p*-Value
INV—>RTB—>EI	.130	.052	.223	.000
EE—>RTB—>EI	.145	.073	.239	.000
TA—>RTB—>EI	.131	.059	.227	.000
SM—>RTB—>EI	.130	.061	.223	.000

Table 7. Moderation results.

			Estimate	S.E.	C.R.	*P*
ZEI	<—	ZRTB	.284	.042	6.833	***
ZEI	<—	ZFS	.206	.041	4.999	***
ZEI	<—	ZFSxZRTB	.426	.041	10.440	***

Notes: ***$p < 0.001$; **$p < 0.01$.

4.5. Mediation analysis

This study looks at how risk-taking behavior functions as a mediator between independents variables and entrepreneurial intention. Baron and Kenny's (1986) definition of partial mediation—a situation in which a mediator has a substantial link with both the dependent and independent variables—is applied in this study. Bootstrapping was used with a sample size of 396 and a confidence interval of 95%, repeated 5,000 times, to evaluate the mediating effects. Table 6 displays the findings, which indicate that the independent variables and entrepreneurial intention link is significantly mediated by the. At a probability threshold of less than 0.001, every pathway was found to be significant, showing significant partial mediation effects and supporting Hypothesis H9.

4.6. Moderation analysis

Table 7 presents the results of the moderation model, examining the influence of risk-taking behavior and family support on entrepreneurial intention. Firstly, the estimate for the direct effect of risk-taking behavior on entrepreneurial intention is 0.284, with a standard error (S.E.) of 0.042. This coefficient yields a critical ratio (C.R.) of 6.833, indicating a significant positive relationship between risk-taking behavior and entrepreneurial intention ($p < 0.001$). Secondly, the estimate for the direct effect of family support on entrepreneurial intention is 0.206, with a S.E. of 0.041. This coefficient results in a C.R. of 4.999, suggesting a significant positive association between family support and entrepreneurial intention ($p < 0.001$). Additionally, the interaction term (FS $\times$ RTB) yields an estimate of 0.426, with a S.E. of 0.041 and a C.R. of 10.440. This significant interaction effect ($p < 0.001$) indicates that family support moderates the relationship between risk-taking behavior and entrepreneurial intention, strengthening the positive impact of risk-taking behavior on entrepreneurial intention when family support is high.

5. Discussion

The findings of this study offer significant insights into the complex interplay among various factors influencing entrepreneurial intentions and behaviors. Confirming H1, the study demonstrates that innovativeness positively impacts entrepreneurial intention, underscoring the pivotal role of innovation in fostering entrepreneurial aspirations. Entrepreneurs often leverage innovative ideas to create value and differentiate themselves in competitive markets. Moreover, H2 is supported, indicating that innovativeness positively influences risk-taking behavior. This suggests that individuals inclined toward innovation are more likely to embrace risk as they pursue novel opportunities. Cultivating a culture of innovation becomes imperative for fostering entrepreneurial intentions and risk-taking behavior, empowering individuals to identify and capitalize on emerging opportunities. This result is supported by the study aligning with established literature (Elshaer & Sobaih, 2022; Huang et al., 2022; Park, 2017; Shahzad et al., 2021).

Similarly, the analysis confirms H3 and H4, revealing that entrepreneurial education positively influences both entrepreneurial intention and risk-taking behavior. This underscores the critical role of education in shaping individuals' entrepreneurial aspirations and equipping them with the necessary knowledge and skills to navigate the complexities of entrepreneurship. Exposure to entrepreneurial education programs fosters a mindset conducive to risk-taking by instilling confidence and providing practical insights into entrepreneurial decision-making. Integrating entrepreneurial education into academic curricula is essential for nurturing entrepreneurial intentions and fostering risk-taking propensity among students. These results are supported by Gazi et al. (2024); Adu et al. (2020) and Shahzad et al. (2021).

Furthermore, the study provides support for H5, indicating a positive correlation between technological adaptability and entrepreneurial intention. Additionally, H6 is validated, suggesting that technological adaptability positively influences risk-taking behavior. This study represents the first of its kind to establish a connection between technological adaptability, propensity for risk-taking, and entrepreneurial intention. The authors contend that individuals proficient in leveraging technology are better equipped to identify and capitalize on emerging opportunities in technologically driven markets, thereby demonstrating a heightened propensity for risk-taking. This underscores the significance of embracing technological advancements to drive entrepreneurial endeavors, as technology acts as a catalyst for innovation and market disruption. Fostering technological literacy and adaptability is deemed crucial for nurturing entrepreneurial intentions and facilitating risk-taking behavior in an increasingly digitized landscape. These assertions are further supported by the study's results and are also relevant to the studies of Parasuraman and Colby (2015) and Hamid (2022).

The findings also affirm H7, indicating that self-management positively influences entrepreneurial intention. Individuals with effective self-management skills, such as goal setting and resilience, are more likely to harbor entrepreneurial aspirations. Moreover, H8 is supported, suggesting that self-management positively influences risk-taking behavior. This underscores the importance of personal efficacy and self-regulation in shaping entrepreneurial intentions and facilitating risk-taking behavior. Cultivating self-management skills is essential for empowering individuals to navigate uncertainties and setbacks

inherent in entrepreneurial endeavors, thereby fostering a conducive environment for entrepreneurial aspirations to flourish. These findings are also supported by the results of the studies conducted by Yu et al. (2022) and Duckworth et al. (2024). Furthermore, the analysis supports H9, indicating that risk-taking behavior positively mediates the relationship between entrepreneurial intention and the suggested variables. This underscores the pivotal role of risk-taking behavior in translating entrepreneurial intentions into action, as supported by Shahzad et al. (2021) and Park (2017). The results also support H10 that family support moderates risk-taking and entrepreneurial intention. Positive family situations boost confidence and provide a safety net, boosting risk-taking and entrepreneurship. Conversely, insufficient family support may discourage risk-taking and entrepreneurial goals. Family support moderates risk-taking and entrepreneurial aspirations, highlighting the value of social networks. Fostering business success requires tailoring interventions to offer potential entrepreneurs with family support. Baluku et al. (2020) and Shahzad et al. (2021) support these findings. In collectivist cultures, such as those in Asia and the Middle East, families play a central role in decision-making, enhancing entrepreneurial intentions through collective encouragement and shared resources, while also aligning ventures with family values and expectations (Wolor et al., 2024). In individualistic societies, family support provides the necessary emotional and practical backing without heavily influencing personal autonomy, allowing entrepreneurs to leverage support while maintaining independence.

6. Conclusion

This study dives into what influences university students' entrepreneurial intentions, providing insights for theory and practice. It looks at factors like entrepreneurial education, innovativeness, tech adaptability, self-management, risk-taking, and family support. The findings stress the need for supportive environments and highlight the importance of fostering innovation. Entrepreneurial education is crucial, so it should be part of academic programs. Being adaptable to technology is also key, especially in today's digital world. Self-management skills are vital for facing challenges. Risk-taking, influenced by family support, affects entrepreneurial goals, showing the importance of supportive social networks. Customized interventions should offer essential family support to aspiring entrepreneurs.

6.1. Theoretical contribution

The theoretical contribution of this research lies in its comprehensive exploration of the interconnectedness of key variables influencing entrepreneurial intentions, namely self-management, innovativeness, technological adaptability, risk-taking behavior, and family support. By addressing gaps identified in the literature, this study advances theoretical understanding in several ways. Firstly, by examining these variables simultaneously rather than in isolation, the research contributes to a more holistic understanding of the factors shaping entrepreneurial intentions. This approach allows for a nuanced exploration of how these variables interact and influence each other within the context of entrepreneurship. Secondly, the study examines the previously unexplored influence of self-management, innovativeness, and technology adaptability on risk-taking behavior and entrepreneurial goals. The research enhances previous theoretical frameworks by clarifying the connections between these elements and provides insights into how individual traits and talents influence entrepreneurial goals. Thirdly, the study focuses on a previously unexplored area in the academic literature about the influence of risk-taking behavior on the connection between these characteristics and entrepreneurial intentions, specifically among students in higher education institutions. By investigating this mediating mechanism, the study provides valuable insights into the fundamental mechanisms by which individual traits impact entrepreneurial goals, therefore enhancing the development of current theoretical frameworks. Lastly, this study investigates the influence of family support on the connection between risk-taking behavior and entrepreneurial goals, a topic that has not been extensively explored in prior research. The research broadens our comprehension of the contextual elements that influence entrepreneurial decision-making and behavior by taking into account the impact of familial support networks.

6.2. Practical implications

The findings of this research carry practical implications for a variety of stakeholders, including policymakers, educators, aspiring entrepreneurs, and the broader community. Policymakers can utilize these insights to craft targeted interventions and policies that foster a more supportive environment for entrepreneurship. They can design targeted initiatives to foster entrepreneurial ecosystems by providing resources, funding, and support systems. Establishing innovation hubs, promoting digital skills alongside entrepreneurship, and encouraging family-oriented programs can enhance entrepreneurial intentions.

Educational institutions can also benefit from these findings by refining entrepreneurial education programs to better cultivate the skills and mindset necessary for business ventures. Educators can refine curricula by integrating practical entrepreneurial courses focused on innovation, risk management, and self-management, while offering experiential learning opportunities such as internships, startup challenges, and mentorship programs. Institutions can design workshops and training sessions to enhance students' technological adaptability and self-management skills. Such programs can prepare them to navigate dynamic markets and manage personal and professional challenges effectively. Institutions could organize events that engage families in entrepreneurial initiatives. This would help build a supportive environment, encouraging students to pursue entrepreneurial ventures with confidence.

Aspiring entrepreneurs, armed with a nuanced understanding of key variables like innovativeness, technological adaptability, and self-management, can make more informed decisions and better navigate the challenges of entrepreneurship. Stakeholders must ensure a comprehensive ecosystem that integrates education, skill-building, mentorship, and family support to create an environment conducive to entrepreneurial growth. Moreover, the broader community stands to gain from the economic development potential inherent in promoting entrepreneurial activities. By fostering a conducive environment for entrepreneurship, communities can benefit from job creation, innovation, and overall economic growth.

The findings of this study have significant cultural and contextual implications, particularly when comparing collectivist societies like Bangladesh to individualist societies. In collectivist cultures, where family and community play a central role, entrepreneurial success often depends on familial support and shared responsibilities. Programs that integrate family involvement and emphasize collaborative entrepreneurship are crucial. In contrast, individualist societies prioritize personal achievement and autonomy, suggesting that entrepreneurship education should focus on innovation, self-reliance, and leadership. Tailoring entrepreneurial programs to these cultural values can enhance their effectiveness, ensuring that both personal and collective entrepreneurial aspirations are nurtured.

6.3. Research limitations

The sample may not be completely representative of all university graduates because it is composed mostly of people from specific academic disciplines, socioeconomic backgrounds, or geographic areas. This may limit the applicability of the findings to larger populations of university graduates. Furthermore, because the data was collected at a particular point in time, this study may have missed changes in entrepreneurial ambitions and attitudes over time. Longitudinal research could shed greater light on the dynamic nature of entrepreneurial decision-making among university graduates. Finally, this study may not fully account for the impact of contextual factors such as cultural norms, institutional support systems, and economic situations on entrepreneurial inclinations among university graduates. Future studies may investigate how these environmental factors interact with individual-level variables to create entrepreneurial decision-making processes.

6.4. Future research guideline

A suggestion is to carry out additional investigations into how entrepreneurial education, innovativeness, technological adaptability, self-management, family support and entrepreneurial intentions are interrelated in various countries, considering their distinctive cultural and economic attributes. Conducting a longitudinal study would offer a more profound comprehension of causation and how things develop

over time. In addition, it is important to factor in other control variables such as gender, socio-economic background, and previous business experience. Entrepreneurship education can be used as a second-order construct. The present investigation centered on a particular group of university students; thus, it is recommended that forthcoming studies make an effort to incorporate a broader range of participants to achieve a more holistic grasp of the topic.

Disclosure statement

The authors declare no conflict of interest.

Ethical statement

The study was conducted in accordance with the Declaration of Helsinki, and approved by the Institutional Ethics Committee of School of Management, Jiujiang University, China for studies involving humans.

Informed consent statement

Informed consent was obtained from all subjects involved in the study.

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About the authors

Dr. Md. Abu Issa Gazi is a Research Fellow at INTI international University and a Professor of Management at School of Management, Jiujiang University, China (JJU-CN). In addition, Dr. Gazi is the Post-doctorate Awardee from Universiti of Malaysia Perlis, Malaysia. Prior to that, he worked as an Assistant Professor, Senior Lecturer and Lecturer at Department of Business Administration in different Universities in Bangladesh. He has also successfully performed various administrative responsibilities. He received his PhD, MBA and BBA with outstanding performance in Management. Dr. Gazi is a confident in face of challenges diligent postgraduate faculty and having a strong critical thinking ability as an exceptionally talented researcher with greater insights, more perspectives and stronger research skills. He has great passion in teaching and research in the field of Business and Management. His research focuses on industrial workers' job satisfaction and job stress, international trade, Human Resources Management, Supply Chain Management, Entrepreneurship, e-commerce and broadly on the field of Business, Economics and Management.

Anika Tasnim Mim is a dedicated MBA student majoring in Human Resource Management (HRM) at the Department of Management Studies, University of Barishal. With an excellent academic record in completing her BBA, she has emerged as an aspiring academician and prominent researcher. Her passion for research is evident in her keen interest in areas such as HRM, management, leadership, entrepreneurship, career development, and tourism. As an emerging researcher, she is actively engaged in various research activities. The research presented by Anika Tasnim Mim not only reflects her individual commitment but also connects to broader projects and issues in the academic landscape, demonstrating her potential impact on the scholarly community.

Dr. Abdullah Al Masud, Associate Professor and Chairman of the Department of Management Studies at the University of Barishal, has established a prominent presence in the academic community. His research has been featured in reputable journals across various fields, including business and social sciences. Dr. Masud's research interests are diverse, encompassing management, leadership, human resource management (HRM), Green HRM, technology, tourism, sustainability, and related areas. His expertise and contributions have earned him recognition and respect in both academic and professional circles.

Md. Kazi Hafizur Rahman, Lecturer in the Department of Business Administration at the University of Global Village (UGV), has established himself as a promising academician and researcher. He completed his BBA and MBA from the Department of Management Studies, University of Barishal, with an excellent academic record. His research interests include HRM, management, leadership, entrepreneurship, supply chain, career development, and tourism. With advanced knowledge of SPSS, AMOS, and Smart PLS, he excels in data analysis. His research articles have been published in prestigious journals, reflecting his dedication and potential to impact the academic community through his active engagement in diverse research activities.

Mohammad Bin Amin is a Doctoral Candidate in the Doctoral School of Management and Business, Faculty of Economics and Business, University of Debrecen, Debrecen, Hungary. Before his doctoral study, he was working as an Associate Professor and Head of the Department of Business Administration, Bangladesh Army University of Science and Technology, Saidpur, Bangladesh. His areas of research interest include management, human resource management, technology management, technology adaptation, leadership, corporate social responsibility, green management, circular economy, environmental economy, green supply chain management, sustainable performance, knowledge management, and renewable energy management. He can be reached at binamindu@gmail.com; binaminbd@mailbox.unideb.hu.

Dr. Abdul Rahman bin S Senathirajah is currently working Associate Professor at Faculty of Business and Communications at INTI International University. Chief Editor of Asian Journal of Management, Engineering and Technology (AJMET). Published a number of papers in ISI, Scopus and international refereed journals in quality management. MQA, Malaysian Quality Assurance Panel Chairman/Member (2009- Current). Served as the Senior Manager - for Quality Assurance and Regulatory. Liaised with MQA and MOHE and various regulatory bodies. Working knowledge of SETARA and MyQuest. Lead Auditor CQI & IRCA Certified ISO 9001:2015. Expert in University KPI design based on Balanced Scorecard. Expertise in Quality Management System Development for Industry and Universities.

Dr. Judit Oláh is a Doctor of the Hungarian Academy of Sciences (DSc), University Professor and Head of Doctoral School of Management and Business Administration, at the John von Neumann University, Hungary and Professor at the Faculty of Economics and Business University of Debrecen. She is also a visiting Professor at the College of Business and Economics, University of Johannesburg, South Africa. Her main area of her research activity is related to biofuels, bioeconomy, technology management, informatics, green technology, Industry 4.0 and 5.0, digitalized supply chain, logistics, bioenergy, food industry, and food security management. She can be reached at olah.judit@uni-neumann.hu

ORCID

Md. Abu Issa Gazi http://orcid.org/0000-0002-1397-8855
Anika Tasnim Mim http://orcid.org/0009-0009-4001-9842
Abdullah Al Masud http://orcid.org/0000-0001-9345-4703
Md. Kazi Hafizur Rahman http://orcid.org/0009-0008-2747-6945
Mohammad Bin Amin http://orcid.org/0000-0002-9184-4828
Abdul Rahman bin S Senathirajah http://orcid.org/0000-0001-6044-9051
Judit Oláh http://orcid.org/0000-0003-2247-1711

Data availability statement

The data presented in this study are available on request from the corresponding author.

References

Adu, I. N., Boakye, K. O., Suleman, A. R., & Bingab, B. B. B. (2020). Exploring the factors that mediate the relationship between entrepreneurial education and entrepreneurial intentions among undergraduate students in Ghana. *Asia Pacific Journal of Innovation and Entrepreneurship*, *14*(2), 215–228. https://doi.org/10.1108/APJIE-07-2019-0052

Aga, M. K. (2023). The mediating role of perceived behavioral control in the relationship between entrepreneurship education and entrepreneurial intentions of university students in Ethiopia. *Journal of Innovation and Entrepreneurship*, *12*(1). https://doi.org/10.1186/s13731-023-00297-w

Ahmed, T., Chandran, V., & Klobas, J. (2017). Specialized entrepreneurship education: Does it really matter? Fresh evidence from Pakistan. *International Journal of Entrepreneurial Behavior & Research*, *23*(1), 4–19. https://doi.org/10.1108/IJEBR-01-2016-0005

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-t

Al-Mamary, Y. H., & Alraja, M. M. (2022). Understanding entrepreneurship intention and behavior in the light of TPB model from the digital entrepreneurship perspective. *International Journal of Information Management Data Insights*, *2*(2), 100106. https://doi.org/10.1016/j.jjimei.2022.100106

Amorós, J. E., Cristi, O., & Naudé, W. (2021). Entrepreneurship and subjective well-being: Does the motivation to start-up a firm matter? *Journal of Business Research*, *127*, 389–398. https://doi.org/10.1016/j.jbusres.2020.11.044

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, *103*(3), 411–423. https://doi.org/10.1037/0033-2909.103.3.411

Anjum, T., Amoozegar, A., Farrukh, M. A., & Heidler, P. (2023). Entrepreneurial intentions among business students: The mediating role of attitude and the moderating role of university support. *Education + Training*, *65*(4), 587–606. https://doi.org/10.1108/ET-01-2021-0020

Anubhav, K., Dwivedi, A. K., & Aashish, K. (2024). Entrepreneurship education in higher education (2002–2022): A technology-empowered systematic literature review. *The International Journal of Management Education*, *22*(3), 100993–100993. https://doi.org/10.1016/j.ijme.2024.100993

Ashari, H., Abbas, I., Abdul-Talib, A. N., & Mohd Zamani, S. N. (2021). Entrepreneurship and sustainable development goals: A multigroup analysis of the moderating effects of entrepreneurship education on entrepreneurial intention. *Sustainability*, *14*(1), 431. https://doi.org/10.3390/su14010431

Baluku, M. M., Kikooma, J. F., Otto, K., König, C. J., & Bajwa, N. U. H. (2020). Positive psychological attributes and entrepreneurial intention and action: The moderating role of perceived family support. *Frontiers in Psychology*, *11*, 546745. https://doi.org/10.3389/fpsyg.2020.546745

Bandura, A. (1986). Social foundations of thought and action: A social cognitive theory. *Englewood Cliffs*, https://ci.nii.ac.jp/naid/10010087207/

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173–1182. https://doi.org/10.1037//0022-3514.51.6.11733806354

Bonfanti, A., De Crescenzo, V., Simeoni, F., & Adaui, C. R. L. (2024). Convergences and divergences in sustainable entrepreneurship and social entrepreneurship research: A systematic review and research agenda. *Journal of Business Research*, *170*, 114336. https://doi.org/10.1016/j.jbusres.2023.114336

Bouncken, R. B., Lapidus, A., & Qui, Y. (2022). Organizational sustainability identity: 'New Work' of home offices and coworking spaces as facilitators. *Sustainable Technology and Entrepreneurship*, *1*(2), 100011. https://doi.org/10.1016/j.stae.2022.100011

Butt, M., Jamil, N., & Nawaz, R. (2015). The mediating role of risk perception among cognitive biases towards decision to start a new venture. *International Letters of Social and Humanistic Sciences*, *54*, 88–95. https://doi.org/10.18052/www.scipress.com/ILSHS.54.88

Cheng, Y., Zheng, Y., Schiavone, F., & Escobar, O. R. (2024). Fantasy of success, fear of failure and entrepreneurial choice: The moderating role of business vibrancy and failure experience. *International Journal of Entrepreneurial Behavior & Research*, *30*(11), 331–359. https://doi.org/10.1108/IJEBR-10-2023-1103

Duckworth, C., Cliffe, B., Pickering, B., Ainsworth, B., Blythin, A., Kirk, A., Wilkinson, T., & Boniface, M. (2024). Characterising user engagement with mHealth for chronic disease self-management and impact on machine learning performance. *NPJ Digital Medicine*, *7*(1), 66. https://doi.org/10.1038/s41746-024-01063-2

Elshaer, I. A., & Sobaih, A. E. E. (2022). I think I can, I think I can: Effects of entrepreneurship orientation on entrepreneurship intention of Saudi Agriculture and Food Sciences graduates. *Agriculture*, *12*(9), 1454. https://doi.org/10.3390/agriculture12091454

Fornell, C., & Larcker, D. F. (1981). Structural equation models with unobservable variables and measurement error: Algebra and statistics. *Journal of Marketing Research*, *18*(3), 382–388. https://doi.org/10.1177/002224378101800313

Gabrielsson, J., Hägg, G., Landström, H., & Politis, D. (2020). Connecting the past with the present: The development of research on pedagogy in entrepreneurial education. *Education + Training*, *62*(9), 1061–1086. https://doi.org/10.1108/ET-11-2019-0265

Gazi, M. a I., Rahman, M. K. H., Yusof, M. F. B., Masud, A. A., Islam, M. A., Senathirajah, A. R. B. S., & Hossain, M. A. (2024). Mediating role of entrepreneurial intention on the relationship between entrepreneurship education and employability: A study on university students from a developing country. *Cogent Business & Management*, *11*(1). https://doi.org/10.1080/23311975.2023.2294514

Georgescu, M. A., & Herman, E. (2020). The impact of the family background on students' entrepreneurial intentions: An empirical analysis. *Sustainability*, *12*(11), 4775. https://doi.org/10.3390/su12114775

Hair, J., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis: A global perspective*. Pearson Education.

Hamid, R. A. (2022). The role of employees' technology readiness, job meaningfulness and proactive personality in adaptive performance. *Sustainability*, *14*(23), 15696. https://doi.org/10.3390/su142315696

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Huang, Y., Li, P., Wang, J., & Li, K. (2022). Innovativeness and entrepreneurial performance of female entrepreneurs. *Journal of Innovation & Knowledge*, *7*(4), 100257. https://doi.org/10.1016/j.jik.2022.100257

Kadiyono, A. L., & Sulistiobudi, R. A. (2024). Linking psychological capital, technology readiness and entrepreneurial orientation to entrepreneurs' financial performance: A study of women MSMEs in Indonesia. *Cogent Business & Management*, *11*(1). https://doi.org/10.1080/23311975.2024.2413380

Lingappa, A. K., Shah, A., & Mathew, A. O. (2020). Academic, family, and peer influence on entrepreneurial intention of engineering students. *Sage Open*, *10*(3), 215824402093387. https://doi.org/10.1177/2158244020933877

Lumpkin, G. T., & Dess, G. G. (1996). Clarifying the entrepreneurial orientation construct and linking it to performance. *The Academy of Management Review*, *21*(1), 135–172. https://doi.org/10.2307/258632

Masud, A. A., Islam, M. T., Rahman, M. K. H., Or Rosid, M. H., Rahman, M. J., Akter, T., & Szabó, K. (2024). Fostering sustainability through technological brilliance: A study on the nexus of organizational STARA capability, GHRM, GSCM, and sustainable performance. *Discover Sustainability*, *5*(1). https://doi.org/10.1007/s43621-024-00495-w

Miralles, F., Giones, F., & Riverola, C. (2016). Evaluating the impact of prior experience in entrepreneurial intention. *International Entrepreneurship and Management Journal*, *12*(3), 791–813. https://doi.org/10.1007/s11365-015-0365-4

Mittal, P., & Raghuvaran, S. (2021). Entrepreneurship education and employability skills: The mediating role of e-learning courses. *Entrepreneurship Education*, *4*(2), 153–167. https://doi.org/10.1007/s41959-021-00048-6

Mohammed, T. B. (2019). The impact of technological advancement on entrepreneurship in an organization. *International Journal of Scientific and Research Publications (IJSRP)*, *9*(6), p90107. https://doi.org/10.29322/IJSRP.9.06.2019.p90107

Murad, M., Wang, M., Shah, S. H. A., & Islam, M. U. (2024). Transitioning from entrepreneurial education to entrepreneurial behavior: The role of opportunity recognition, entrepreneurial social networks, and risk-taking propensity. *The International Journal of Management Education*, *22*(3), 101053. https://doi.org/10.1016/j.ijme.2024.101053

Othman, N. H., Othman, N., & Juhdi, N. (2020). Entrepreneurship education and business opportunity exploitation: Positive emotion as mediator. *Jurnal Cakrawala Pendidikan*, *39*(2), 370–381. https://doi.org/10.21831/cp.v39i2.30102

Parasuraman, A., & Colby, C. L. (2015). An updated and streamlined technology readiness index. *Journal of Service Research*, *18*(1), 59–74. https://doi.org/10.1177/1094670514539730

Park, C. (2017). A study on effect of entrepreneurship on entrepreneurial intention. *Asia Pacific Journal of Innovation and Entrepreneurship*, *11*(2), 159–170. https://doi.org/10.1108/APJIE-08-2017-024

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *The Journal of Applied Psychology*, *88*(5), 879–903. https://doi.org/10.1037/0021-9010.88.5.879

Porfírio, J., Felício, J. A., Carrilho, T., & Jardim, J. (2023). Promoting entrepreneurial intentions from adolescence: The influence of entrepreneurial culture and education. *Journal of Business Research*, *156*, 113521. https://doi.org/10.1016/j.jbusres.2022.113521

Putniņš, T. J., & Sauka, A. (2020). Why does entrepreneurial orientation affect company performance? *Strategic Entrepreneurship Journal*, *14*(4), 711–735. https://doi.org/10.1002/sej.1325

Renn, R. W., Allen, D. G., & Huning, T. M. (2011). Empirical examination of the individual-level personality-based theory of self-management failure. *Journal of Organizational Behavior*, *32*(1), 25–43. https://doi.org/10.1002/job.667

Rubel, M. R. B., Kee, D. M. H., & Rimi, N. N. (2020). Matching people with technology: Effect of HIWP on technology adaptation. *South Asian Journal of Human Resources Management*, *7*(1), 9–33. https://doi.org/10.1177/2322093719875567

Shahzad, M., Khan, K. I., Saleem, S., & Rashid, T. (2021). What factors affect the entrepreneurial intention to start-ups? The role of entrepreneurial skills, propensity to take risks, and innovativeness in open business models. *Journal of Open Innovation*, *7*(3), 173. https://doi.org/10.3390/joitmc7030173

Sharaf, A., El-Gharbawy, A., & Ragheb, M. A. (2018). Factors that influence entrepreneurial intention within University Students in Egypt. *OALib*, *05*(10), 1–14. https://doi.org/10.4236/oalib.1104881

Soluk, J., Kammerlander, N., & Darwin, S. (2021). Digital entrepreneurship in developing countries: The role of institutional voids. *Technological Forecasting and Social Change*, *170*, 120876. https://doi.org/10.1016/j.techfore.2021.120876

Thurik, R., Audretsch, D. B., Block, J., Burke, A., Carree, M., Dejardin, M., Rietveld, C. A., Sanders, M., Stephan, U., & Wiklund, J. (2023). The impact of entrepreneurship research on other academic fields. *Small Business Economics*, 1–25. https://doi.org/10.1007/s11187-023-00781-3

Uddin, M., Chowdhury, R. A., Hoque, N., Ahmad, A., Mamun, A., & Uddin, M. N. (2022). Developing entrepreneurial intentions among business graduates of higher educational institutions through entrepreneurship education and entrepreneurial passion: A moderated mediation model. *The International Journal of Management Education*, *20*(2), 100647. https://doi.org/10.1016/j.ijme.2022.100647

Vinzi, V. E., Chin, W. W., Henseler, J., & Wang, H. (2010). *Handbook of partial least squares: Concepts, methods and applications*. Springer Science & Business Media.

Wardana, L. W., Narmaditya, B. S., Wibowo, A., Mahendra, A. M., Wibowo, N. A., Harwida, G., & Rohman, A. N. (2020). The impact of entrepreneurship education and students' entrepreneurial mindset: The mediating role of attitude and self-efficacy. *Heliyon*, *6*(9), e04922. https://doi.org/10.1016/j.heliyon.2020.e04922

Wathanakom, N., Khlaisang, J., & Songkram, N. (2020). The study of the causal relationship between innovativeness and entrepreneurial intention among undergraduate students. *Journal of Innovation and Entrepreneurship*, *9*(1). https://doi.org/10.1186/s13731-020-00125-5

Wolor, C. W., Eranza, D. R. D., Rababah, M. A., Hoo, W. C., Nurkhin, A., Richard, Y. F., & Rahman, A. (2024). Increasing the competency of prospective coffee entrepreneurs through experiential training in coffee tourism villages: Case study of young entrepreneurs in Indonesia. *International Journal of Sustainable Development and Planning*, *19*(5), 1683–1690. https://doi.org/10.18280/ijsdp.190506

Yu, J., Yuan, L., Han, G., Li, H., & Li, P. (2022). A study of the impact of strategic human resource management on organizational resilience. *Behavioral Sciences (Basel, Switzerland)*, *12*(12), 508. https://doi.org/10.3390/bs12120508

Appendix

Constructs	Items	Sources
Innovativeness		
INT1	I like trying uncommon and safe activities.	(Elshaer & Sobaih, 2022; Huang et al., 2022)
INT2	I prefer unique and innovative ideas rather than relying on established and conventional procedures in tasks.	
INT3	I have a preference for adopting an individualized approach to acquiring new knowledge, rather than adhering to traditional methods.	
INT4	I prefer creative problem-solving and unique approaches over common methods.	
INT5	I can think of a lot of original ideas quickly.	
Entrepreneurial Education		
EE1	The entrepreneurship programme makes me really want to start my own business.	(Aga, 2023; Gazi et al., 2024)
EE2	Entrepreneurship training enhances knowledge in business start-up.	
EE3	Education in entrepreneurship makes it easier to start a business.	
EE4	My university campus environment motivated me to become entrepreneurial.	
EE5	Entrepreneurial Education program enhance my ability to identify opportunity.	
Technological adaptability		
TA1	I'm open to adopting new technologies in both my personal and professional life.	(Parasuraman & Colby, 2014; Hamid, 2022)
TA2	I eagerly explore the features and functionalities of a new technology when it's introduced.	
TA3	I readily adapt to new and significantly different technology changes.	
TA4	I actively seek opportunities to improve my technological skills and knowledge.	
TA5	I am confident in my ability to troubleshoot and solve technical issues when using digital devices and applications.	
Self-management		
SM1	I can resist distractions and focus on my work.	(Yu et al., 2022; Renn et al., 2009)
SM2	I set goals that are hard for me to reach.	
SM3	I set clear goals for myself.	
SM4	I can effectively manage my time to accomplish tasks and responsibilities.	
SM5	I am skilled at regulating my emotions, even in challenging situations.	
Risk-taking Behavior		
RTB1	I appreciate stepping outside my comfort zone and doing daring things.	(Elshaer & Sobaih, 2022)
RTB2	I'm ready to put a lot of time and/or money into an endeavour if it has the potential to pay off handsomely.	
RTB3	When things get dangerous, I usually take aggressive action.	
RTB4	I enjoy trying new things, even if there's a chance of failure or negative outcomes.	
RTB5	When making decisions, I'm willing to take calculated risks instead of always choosing the safer option	
Family Support		
FS1	Entrepreneurship is valued more in my immediate family than in other pursuits and occupations.	(Lingappa et al., 2020; Maresch et al., 2016)
FS2	If I became an entrepreneur, my parents would react positively.	
FS3	Extended family members turn into entrepreneurship	
FS4	If I became an entrepreneur, my other family members would react positively	
FS5	My family member would encourage me to launch a company.	
Entrepreneurial Intention		
EI1	I am fully committed to taking any necessary actions to become an entrepreneur.	(Ahmed et al., 2017; Miralles et al., 2015)
EI2	I have contemplated the idea of establishing a company with great seriousness.	
EI3	I want to be my own boss.	
EI4	I've really thought about starting my own business when I'm done with education.	
EI5	My professional goal is to become an entrepreneur.	