Educational Capabilities, Opportunity Recognition and Entrepreneurial Intention: A Higher Education-Based Analytical Framework

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Abstract: This paper asks how entrepreneurial education, entrepreneurial capabilities, and perceived opportunity work together to shape students' entrepreneurial intention (EI), and it looks specifically at whether attitude toward entrepreneurship (ATE), subjective norms (SN), and perceived behavioral control (PBC) carry that influence through. Data were gathered via questionnaire from 350 postgraduate students at universities in Iraq, and the resulting quantitative dataset was tested against the proposed hypotheses using structural equation modeling. ATE and PBC turned out to be the channels through which the main predictors reach EI, while SN's mediating role was not statistically significant. Practically, the findings point toward entrepreneurship-focused educational programming that builds students' knowledge, skills, and readiness to launch and run ventures. Where prior work has largely stopped short of examining ATE, SN, and PBC together as joint mediators, this study fills that gap by folding all three into the pathway connecting entrepreneurial education, capabilities, and perceived opportunity to entrepreneurial intention.

1 INTRODUCTION

As unemployment has climbed, attention has turned to entrepreneurship as one path toward economic growth and job creation [1]. Yet the opportunities entrepreneurship offers come with real obstacles in developing economies like Iraq, where perceived risk, scarce mentorship, and unstable business conditions still stand in the way [2]. These obstacles make it all the more important to cultivate students' entrepreneurial intention and present entrepreneurship as a genuine career option [3]. Universities and policymakers, in turn, have reason to nurture an entrepreneurial mindset among postgraduate students so that more of them become job creators instead of job seekers [4]. A mix of economic, managerial, and psychological factors shapes entrepreneurial activity [2], [4], and within the psychological strand of this literature, entrepreneurial intention (EI) has emerged as a leading predictor of subsequent entrepreneurial behaviour [5]. The theory of planned behaviour (TPB) frames EI as being shaped jointly by attitude towards entrepreneurship (ATE), perceived behavioural control (PBC) and subjective norms (SN) [6]-[8]. The present study looks at how entrepreneurial education (EE), perceived opportunity (PO), and entrepreneurial capabilities (EC) shape EI [6], [9], treating ATE, PBC, and SN as mediating variables. The study offers several conceptual contributions to entrepreneurship scholarship by targeting specific gaps in the literature. First, it broadens the EI literature by testing the antecedents of EI, ATE, PBC, and SN across different settings [10]. Second, it moves the discussion of opportunity recognition beyond the usual focus on entrepreneurial drivers to a more thorough treatment of promising opportunities [11]. Third, it weighs in on the unresolved question of how EE affects EI, given that prior findings have pointed in both positive and negative directions [6]. Finally, it answers calls to broaden entrepreneurship research past undergraduate samples toward wider adult populations, postgraduate students included [12]. Furthermore, the determinants of EC at regional and cross-country levels remain an underexplored area of study. Finally, the study deepens theoretical

understanding of how EI forms by treating EE, EC, and PO as independent variables and ATE, PBC, and SN as mediators within a TPB framework. Because Iraq's economy leans so heavily on oil and lacks income diversification, government policy has come to prioritize building an entrepreneurial ecosystem, and public universities are positioned as key hubs of research and innovation in that effort. The insights generated here are intended to offer strategic direction for postgraduate students and for stakeholders - policymakers, universities, and other organizations - grappling with similar economic pressures.

2 THEORETICAL BACKGROUND AND HYPOTHESIS DEVELOPMENT

In statistical terms, mediation describes a situation where a third variable sits between two causally connected variables and changes how strongly or in what way they relate [13]. Human capital theory ties education to intention by arguing that skills gained through education and training make EI stronger [1]. EE, in this sense, covers the educational initiatives that build EI and give people the awareness and career pathways needed to start a venture, and prior work has already documented a link between EE and EI [14]. Within TPB, ATE captures how positively or negatively a person evaluates a given behaviour [7], and individuals holding a favourable ATE tend to report stronger EI than those with unfavourable views [15]. Because ATE reinforces intention directly, and because EE acts as a contextual modifier tied to both ATE and EI [10], the literature has repeatedly linked EE to ATE [2], [16]. Education, in other words, strengthens attitude, and a stronger attitude in turn strengthens the intention to act entrepreneurially: EE exposes people to entrepreneurial experience, role models, and theory, which builds a more positive ATE and, through it, a higher EI. This reasoning leads the study to hypothesize that ATE mediates the association among EE and EI. PBC, the second TPB component, reflects how capable a person feels of actually carrying out entrepreneurial tasks [7]; those who rate their PBC highly tend to face business challenges with more confidence, which feeds back into stronger EI [17], and prior studies have already established a direct link between EE and PBC [2], [16]. EE lifts how capable people feel about their own entrepreneurial abilities, which lifts EI along with it [17], and as that confidence grows through EE, so does the likelihood that a person will actually pursue entrepreneurship [4]. Building on this, the study proposes PBC as a mediator between EE and EI. The third TPB indicator, SN, captures how much sway social circles - family, friends, peers - hold over a person's entrepreneurial intentions [7]. What people believe others expect of them with respect to entrepreneurship affects how likely they are to actually engage in it [15], and research connecting EE with SN has underscored just how much social influence contributes to EI [16]. Based on these arguments, the study proposes the following hypotheses:

- H1. ATE mediates the relationship between EE and EI among students;
- H2. PBC mediates the relationship between EE and EI among students;
- H3. SN mediates the relationship between EE and EI among students.

2.1 EC ATE PBC SN and EI

EC has been shown to correlate positively with a person's intention to start a business [17], [18]. It covers the skills and knowledge that turn entrepreneurial intent into action, and evidence suggests that entrepreneurs with stronger EC are more proactive about seeking out and exploiting new opportunities [12]. Earlier work within the TPB framework has established that ATE meaningfully influences EI [12], and PBC has likewise emerged as a robust predictor of EI [19], since PBC captures how easy a person feels it would be to engage in entrepreneurial activity given their available resources and capabilities [7]. Individuals with higher EC often develop stronger PBC, as they perceive fewer obstacles to entrepreneurship [20].SN also play into how EI takes shape: work by [8] found that SN raise a person's EI, essentially by capturing how a person reads the entrepreneurial attitudes of family, friends, and peers around them [10]. When society's view of entrepreneurship turns more favourable, individual EI tends to climb with it [7]; and because family, friends, and colleagues typically know a person's skills and abilities well, their advice and guidance shape entrepreneurial choices directly [21]. EC, for its part, also affects EI directly, though a study by [22] shows that the EC-EI relationship is more complex than direct influence alone can explain. Von Arnim and Mrozewski (2020) [21] and Kang et al. (2024) [12]_investigated the mediating role of elements of TPB in this relationship, noting that the relationship between digital skills specifically and EI still needs more investigation alongside other skill types such as EC, and they flagged the value of broadening study samples to include adults, graduate students among them, [12]. Based on these findings, the study proposes the following hypotheses:

- H4. ATE mediates the relationship between EC and EI among students;
- H5. PBC mediates the relationship between EC and EI among students;
- H6. SN mediates the relationship between EC and EI among students.

2.2 PO ATE PBC SN and EI

PO denotes the external conditions that raise the odds of a venture succeeding [20]. Evidence points to PO as a an important antecedent among the TPB factors [19], and studies consistently report a positive PO-EI correlation [23],, confirming that perceiving opportunities feeds into entrepreneurial intentions [1], [20]. Recognizing an opportunity tends to motivate people to actually pursue entrepreneurship [12]. Prior research has established PO as a significant determinant of ATE. Whenever there is a shortage of information about whether an opportunity is actually feasible, it drives up perceived uncertainty, and that uncertainty, in turn, pushes people toward a less favourable assessment of the opportunity [14]. PO functions as the chief driver of the entrepreneurial process and, in doing so, plays a key part in forming ATE [4]; people who are skilled at spotting business opportunities generally end up with a more favourable ATE [22], [24]. PO similarly shapes PBC [25] given that people who treat risk itself as an opportunity tend to build a stronger feeling of control over their own entrepreneurial actions [24]. Accordingly, the study hypothesizes that PBC mediates between PO and EI: exposure to entrepreneurial opportunities builds up experience and resources that, in turn, boost a person's confidence in their own entrepreneurial ability, so that people who feel greater control over entrepreneurial activities are more inclined to pursue it [4]. Additionally, research suggests that the perception of profit-making opportunities positively influences SN [25]. Opportunity recognition enhances the perceived desirability of creating a venture, making entrepreneurship more attractive [4]. Ng et al. (2021) [22] and Huang and Kee (2024) [4] explored the relationship between PO and EI, recommending further studies that integrate moderating and mediating variables to better understand how PO influences students' EI in different organisational settings [1]. Many researchers have also suggested employing personality traits, demographic factors, and other variables as mediators or modifiers to enhance the measurement of EI. Based on the above, the following hypotheses are proposed:

- H7. ATE mediates the relationship between PO and EI among students;
- H8. BPC mediates the relationship between PO and EI among students;
- H9. SN mediates the relationship between PO and EI among students.

In light of this discussion, Figure 1 presents the proposed conceptual framework, which has been developed and substantiated based on prior research.

3 METHODOLOGY

3.1 Respondents and Procedure

The study sample consisted of postgraduate students (Master's and PhD) enrolled in entrepreneurship courses at Iraqi universities. Sample size was determined using Thomson's formula (2002). A total of 2,800 students were randomly selected in coordination with student affairs departments from 12 universities in Iraq. Participants were distributed as 135 students from universities in southern Iraq, 126 from central Iraq, and 89 from western and northern Iraq. 300 electronic questionnaires were distributed, yielding 275 responses, of which 260 were valid for analysis. In addition, 100 paper questionnaires were distributed, receiving 93 responses, of which 90 were valid. The final sample consisted of 350 postgraduate students. The data collection period lasted one month (January 2025). Table 1 summarizes the characteristics of the study sample. To minimize bias, several measures were implemented: 1) rewording some questionnaire items to reduce response pattern bias; 2) separating data sources for independent, mediating, and dependent variables to minimize Common Method Biases; and 3) ensuring respondent confidentiality to encourage honest and truthful answers. After data collection, statistical tests were conducted to compare early and late responses and identify any potential biases. The analysis revealed no statistically significant differences between responses collected at the beginning and end of the month, indicating no concerns about response bias in the dataset.

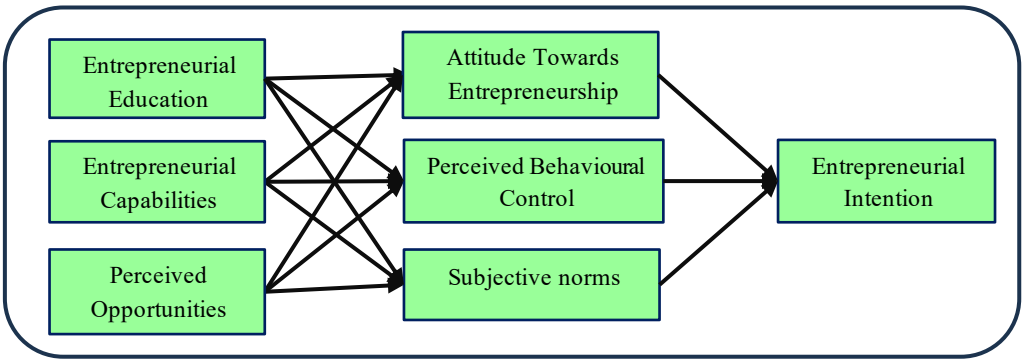

Figure 1: Research framework.

Table 1: Respondents' demographic profile (N = 350).

Demographic variables	Category	Frequency	Percentage (%)
Gender	Female	186	53.1
	Male	164	46.8
Marital Status	Married	198	56.3
	Single	152	43.4
Age Group	25-35	211	60.2
	36-45	139	39.7
Study level	Master's students	247	70.5
	Doctoral students	103	29.4
Field of study	Management and economics	112	3.2
	Engineering	88	2.5
	Agriculture	78	2.2
	Technology	72	2.05

3.2 Measurement

To keep the study variables valid and reliable, previously validated measurement scales were used throughout. All items were rated on a five-point Likert scale running from 1 (strongly disagree) to 5 (strongly agree), and to make sure respondents understood the items correctly, the questionnaire was translated into Arabic by specialist linguists who checked both the meaning and the intent of each item. The Entrepreneurial Education variable was measured using the six-item scale developed [9]. Entrepreneurial Capabilities were measured using the five-item scale from Manimala et al. (2019), [5]. Perceived Opportunity was measured using the four-item scale developed by Chen et al. (2020), [26]. Attitude Towards Entrepreneurship was measured using a five-item scale, modified to align with the study's objectives. Perceived Behavioral Control was measured using a six-item scale based on Subjective Norms, and Entrepreneurial Intention was measured using a three-item scale from the study by Liñán and Chen [8].

4 DATA ANALYSIS

The data for this research were analyzed using SmartPLS 4 for structural equation modeling, by applying the partial least squares (PLS) method [27].

4.1 Assessment of Measurement Model

Convergent validity was checked by examining the factor loadings for each item, applying a >0.70 cutoff; five items - EE5, EC2, PO4, PBC6, and EI5 - fell below this threshold and were dropped as unreliable. Composite reliability (CR) came out above 0.70 across the board, which counts as acceptable, and Average Variance Extracted (AVE) likewise cleared the 0.50 bar for every construct. Internal consistency was assessed using Cronbach's alpha, with all values meeting the acceptability threshold of >0.70 [13]. To evaluate the coefficient of determination (R^2), the extent to which independent variables explain the variance in the dependent variable was examined. A multicollinearity test was performed to ensure no significant correlation existed between independent variables. This was determined based on the variance

inflation factor (VIF), which must be less than 10 or greater than 0.5. all values were below 0.5, confirming the absence of multicollinearity issues. As shown in Table 2. Discriminant validity was assessed using latent variable correlation analysis, verifying that the correlation of each variable with itself was higher than its correlation with other variables in the model. The results, presented in Table 3, confirmed the acceptability of these values [28].

4.2 Descriptive Statistics

Table 4 presents the means and standard deviations for all study variables. The results indicate that the mean values are average, suggesting a balanced distribution of responses. The low standard deviation values reflect a high degree of homogeneity in the dataset. The correlation coefficients between the independent variables remained below 0.5, indicating that the relationships between variables are relatively weak. Furthermore, the absence of multicollinearity confirms that the independent variables do not exhibit significant overlap, thereby supporting the study's hypotheses.

4.3 Assessment of Structural Model

To test the hypotheses, path structural modelling was used to examine the indirect effects of the independent variables (EE, EC and PO) on the dependent variable (EI) through the mediating variables (ATE, PBC and SN). Hypotheses were considered supported if $p \leq 0.05$ and if the confidence intervals (CIs) did not include zero [29]. The results confirm that most indirect effects were statistically significant, except for the mediation of SN in the relationships between EE and EI, EC and EI and PO and EI, which were not supported. Specifically, ATE mediated the relationship between EE and EI ($p \leq 0.01$, H1). PBC mediated the relationship between EE and EI ($p \leq 0.01$, H2). ATE mediated the relationship between EC and EI ($p \leq 0.01$, H4). PBC mediated the relationship between EC and EI ($p \leq 0.01$, H5). ATE mediated the relationship between PO and EI ($p \leq 0.01$, H7). PBC mediated the relationship between PO and EI ($p \leq 0.01$, H8). However, the mediation of SN in the relationships between EE and EI (H3), EC and EI (H6), and PO and EI (H9) was not significant ($p > 0.01$), as the confidence intervals included zero. These findings are summarised in Table 5.

5 DISCUSSION

This study set out to test how EE, EC, and PO affect graduate students' EI once ATE, PBC, and SN are accounted for as mediators, and it found that ATE and PBC are the channels through which EE, EC, and PO reach EI, with SN's mediating effect not reaching significance.

Table 5 lays out the indirect effects of these mediators on the EE-EC-PO-EI relationships, and the picture that emerges is mixed. H1 and H2 held up, meaning ATE and PBC each significantly mediated the EE-EI link - in other words, EE lifts EI by strengthening how students feel about entrepreneurship and how much control they believe they have over it. That points toward educational programs that deliberately build ATE and PBC as a way of promoting entrepreneurial intention, a conclusion that lines up with earlier findings from Malaysia and China where ATE and PBC likewise emerged as key mediators [16].

H3, by contrast, did not hold up, since SN's mediating effect fell short of significance - a result that matches [25] but runs counter to [10], whose sample was Ethiopian university students. H4 and H5 were both supported, but H6 was not, and this null result for SN echoes what [4] previously reported. One explanation is that SN operates more through social effects than through individual traits [21]. Separately, ATE and PBC were found to meaningfully shape the EC-EI relationship, a result that aligns with Huang and Kee (2024), [4]. A plausible reason is that EC gives students access to information, lowers the uncertainty they perceive in their environment, and builds their confidence in their own capabilities, all of which raise the odds of entrepreneurial success [21]. Hypotheses 7 and 8 were supported but hypothesis 9 was not, which departs from Huang and Kee (2024), [4], who reported a significant SN effect on EI. ATE and PBC were also found to mediate between PO and EI, which confirms how central they are to turning PO into EI [4], [22]. Together these results paint a fuller picture of how PO ultimately becomes EI and point to universities as key players in cultivating PBC and a positive ATE among Iraq's graduate students.

Table 2: Results of the measurement model.

Constructs	Items	Factor Loading	VIF Values	AVE	CR	R2	Cronbach's alpha
EE	EE1	0.713	2.037	0.625	0.892	-	0.822
	EE2	0.844	2.067				
	EE3	0.745	1.031				
	EE4	0.745	1.025				
	EE6	0.891	2.015				
EC	EC1	0.852	2.068	0.726	0.920	-	0.814
	EC3	0.775	1.053				
	EC4	0.854	1.044				
	EC5	0.921	3.045				
PO	OP1	0.811	1.030	0.686	0.867	-	0.875
	OP2	0.772	1.003				
	OP3	0.897	2.030				
ATE	ATE1	0.842	1.002	0.653	0.882	0.501	0.933
	ATE2	0.876	1.035				
	ATE3	0.792	1.339				
	ATE5	0.714	1.036				
PBC	PBC1	0.945	2.009	0.699	0.920	0.490	0.982
	PBC2	0.879	2.075				
	PBC3	0.732	1.046				
	PBC4	0.752	1.055				
	PBC5	0.855	3.029				
SN	SN1	0.877	1.030	0.780	0.913	0.591	0.853
	SN2	0.789	2.003				
	SN3	0.974	1.034				
EI	EI1	0.846	1.251	0.659	0.906	0.504	0.711
	EI2	0.777	2.100				
	EI3	0.832	2.092				
	EI4	0.874	2.086				
	EI6	0.723	1.203				

Table 3: Discriminant validity-latent variable correlations.

Variables	EE	EC	PO	ATE	PBC	SN	EI
EE	0.790						
EC	0.452	0.852					
PO	0.465	0.599	0.828				
ATE	0.361	0.596	0.553	0.808			
PBC	0.443	0.459	0.436	.0486	0.836		
SN	0.506	0.558	0.602	0.594	0.455	0.883	
EI	0.468	0.389	0.523	0.431	0.537	0.398	0.811

Note: EE = Entrepreneurial Education, EC = Entrepreneurial Capabilities, PO = Perceived Opportunity, ATE = Attitude Towards Entrepreneurship, PBC = Perceived Behavioural Control, SN = Subjective Norms, EI = Entrepreneurial Intention.

Table 4: Descriptive statistics.

	Mean	SD	EE	EC	PO	ATE	PBC	SN	EI
EE	3.99	.411	1						
EC	3.98	.438	.465**	1					
PO	4.06	.492	. 548**	.336**	1				
ATE	4.12	.400	.476**	.446**	.202**	1			
PBC	3.93	.389	.406**	.345**	.556**	.440**	1		
SN	3.61	.454	. 398**	.505**	. 468**	.165**	.474**	1	
EI	3.82	.448	.496**	.538**	.432**	.368	.452**	.402**	1

Table 5: Assessment of structural model: hypotheses.

Paths	β	SD	T-value	P- values	2.5%	97.5%	Decision
H1: EE > ATE > EI	0.346	0.060	5.794	0.000	0.215	0.449	Supported
H2: EE > PBC > EI	0.448	0.059	7.593	0.000	0.118	0.072	Supported
H3: EE > SN > EI	0.073	0.028	2.575	0.370	-0.122	0.011	Unsupported
H4: EC > ATE > EI	0.097	0.040	2.408	0.001	0.014	0.172	Supported
H5: EC > PBC > EI	0.588	0.058	10.100	0.000	0.469	0.701	Supported
H6: EC > SN > EI	0.036	0.023	1.568	0.117	-0.082	0.008	Unsupported
H7: PO > ATE > EI	0.210	0.039	0.538	0.000	0.021	0.055	Supported
H8: PO > PBC > EI	0.189	0.047	4.021	0.000	0.185	0.002	Supported
H9: PO > SN > EI	0.041	0.019	2.184	0.199	-0.006	0.078	Unsupported

5.1 Theoretical and Practical Implications

This work contributes to entrepreneurship scholarship in three ways. It helps build an explanatory framework that connects EE, EC, and PO to the cognitive dimensions of planned behaviour theory, deepening how EI can be explained [3], [10]. It also adds to the still-thin body of entrepreneurship research set in Iraq, a country marked by climbing unemployment tied to its dependence on oil [30]. And it addresses gaps around EE, EC, and PO left by earlier work, answering recent calls for more research on EI [6], [11], [12]. On the practical side, the findings suggest several things universities and policymakers can do. Iraqi universities are well placed to nurture entrepreneurial tendencies among graduate students through targeted programs that build an entrepreneurial mindset. EE itself should move past pure theory to include hands-on activities - launching projects, developing venture ideas, drafting business plans - and universities should sharpen students' EC by training them in problem-solving and decision-making and by connecting their entrepreneurial skills to real workplace settings. Policymakers and universities alike should also make EE a priority within higher-education curricula as a way of tackling unemployment and helping students spot and develop entrepreneurial opportunities in their own communities.

5.2 Limitations of the Study and Future Research Directions

A few limitations of the present study point toward useful directions for future work. The data came from a relatively narrow sample of graduate students at Iraqi universities, so caution is warranted in generalizing the findings to other groups or sectors; longitudinal designs in future research would allow a deeper look at how the mediating variables behave and would strengthen confidence in the proposed model over time. It would also be worth extending the model by incorporating environmental or personal factors as additional mediators or interacting variables, which could broaden understanding of EI and inform more effective entrepreneurial interventions and strategies going forward.

6 CONCLUSIONS

This study set out to determine how EE, EC, and PO foster EI once ATE, SN, and PBC are treated as mediating variables, finding that EE, EC, and PO all matter meaningfully for EI - a result with clear relevance for universities and policymakers alike. Given how much entrepreneurship can help absorb unemployment, these findings argue for deliberate strategies to cultivate an entrepreneurial mindset among graduate students as a route toward job creation and economic development. The evidence further points to attitude toward entrepreneurship and perceived behavioral control as the main channels through which entrepreneurial education, capabilities, and opportunity recognition translate into entrepreneurial intention, with subjective norms playing only a marginal role by comparison.

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