Role Play of Artificial Intelligence, Social Norms, and Behavioral Control for Entrepreneurial Intention

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Abstract

The main goal of this study is to ascertain the link between entrepreneurial intentions and performance expectations for artificial intelligence (AI) solutions, as well as the mediating function of antecedents of entrepreneurial intentions in this relationship. Undergraduate business students (n=247) from a university in Punjab, Pakistan, served as the sample for this study. A self-administered questionnaire survey was utilized to gather the data, and it included two parts: demographic traits, performance expectations for artificial intelligence, and entrepreneurial goals. Utilizing PLS-SEM, the data were analyzed. The findings showed that the performance expectation of artificial intelligence favorably influences entrepreneurial goal intention (EGI). This indicates that people who are more likely to want to start their own business are those who think AI-related solutions are valuable. In addition, it was discovered that social norms and perceived behavioral control mediated EGI and AI performance expectations. Knowledge in this area of research might develop with a deeper understanding of how artificial intelligence will behave in various locations, cultures, and circumstances. The findings of this study may be used by policymakers, educators, and university administrators to promote entrepreneurship throughout the nation.

Keywords: Entrepreneurial goal intention, Artificial intelligence, Entrepreneurial intention, social norms, Behavioral control

Introduction

Due to its fundamental components of job creation and innovation, entrepreneurship is crucial to the economic development of every nation (Soomro & Shah, 2023). The direct relationship between entrepreneurship and self-employment can mitigate several problems associated with youth and a country's growth. This is one of the primary reasons that entrepreneurial intentions have become a trending topic for researchers and scholars. Several studies have been conducted to investigate entrepreneurial intentions, their impacts, and outcomes, yet there is more room for research to explore it further, especially in the high-tech era of artificial intelligence (Galvão et al., 2023; Wang et al., 2023). Moreover, entrepreneurial intentions steered by the performance expectancy of artificial intelligence solutions have recently received much attention from researchers, as previously, both variables had not been extensively investigated together (Dabbous & Boustani, 2023). Performance expectancy refers to the level one believes that using an AI system will help achieve better results and improve his or her job performance (Wang et al., 2023). It can be said that the performance expectations of artificial intelligence solutions substantially impact a person's decision to pursue entrepreneurship as a profession, and this link demands careful investigation.

Similarly, studies suggest that encouragement from friends and family significantly influences an individual's entrepreneurial intentions, and one's faith in the utility of AI solutions is found to lead to an individual's intentions to become an entrepreneur (Giacomin et al., 2022). Therefore, it is crucial to identify if there is any connection between the individual's belief in AI-related solutions and an individual's intention to become an entrepreneur. The way AI is changing business and technology makes it significantly important to study this connection. Entrepreneurs frequently look for novel ways to meet market demands, and realizing AI's potential benefits may encourage people to launch AI-related businesses. Entrepreneurs who believe in the potential of AI solutions may be able to recognize opportunities that others would miss, which may potentially motivate them to pursue their entrepreneurial goals.

Literature Review

Entrepreneurial intentions encompass an individual's deliberate strategies, incentives, and readiness to initiate and manage their own business undertaking (Soomro & Shah, 2023). The individual's ambition is to engage in entrepreneurial pursuits, establish novel enterprises, and embrace the associated risks inherent in entrepreneurship. A popular theoretical framework for examining the factors that affect intentions to launch a business is the Theory of Planned conduct (TPB) (Ajzen & Driver, 1992). The theory states that an intention is an anticipated outcome guided by

planned actions (Armitage & Conner, 2001). This psychological theory states three factors (Dabbous & Boustani, 2023).

The first one is the attitude toward behavior, the next one is the subjective norms, which means what will be a (perceived) person's behavior under social pressure, and the last one is perceived behavioral control, which is the perceived capability to perform the behavior (Kautonen et al., 2015). When all these three factors come together, they structure a person's behavioral intentions. According to TPB, a person's intention to engage in a behavior is the immediate forerunner of a purposeful action, although intentions are influenced by a person's attitude, social norms, and perceived behavioral control. These three are behavioral intent's immediate predecessors.

AI originated in the 1830s when Charles Babbage and Ada Lovelace initially developed it as an "Analytical Engine" (Russell & Norvig, 1995). Performance expectancy refers to the level at which one believes using an AI system will help achieve better results and improve job performance (Gursoy et al., 2019). Performance expectancy for using AI solutions is a potential driver to bring technological changes for creating new entrepreneurial activities and venture creation, being more efficient and innovative (Briel et al., 2018).

Therefore, it can be said that the performance expectations of artificial intelligence solutions significantly affect a person's decision to pursue entrepreneurship as a profession. studies suggest that encouragement from friends and family significantly influences an individual's entrepreneurial intentions, and one's faith in the utility of AI solutions is found to lead to an individual's intentions to become an entrepreneur (Giacomin et al., 2022). Therefore, the following hypothesis is proposed:

H1: Performance expectancy of AI solutions positively influences entrepreneurial intentions.

It is well determined that social norms contribute to a person's decision to become an entrepreneur (Giacomin et al., 2022). Also, studies explain that social network support influences entrepreneurial intentions not independently but as a contributing factor in encouraging entrepreneurship in individuals (Lee et al., 2021). Hence, the following hypotheses are proposed:

H2: Performance expectancy of AI solutions positively influences perceived behavioral control.

H3: Performance expectancy of AI solutions positively influences social norms.

Entrepreneurial perceived behavioral control refers to a person's level of self-confidence in their ability to do entrepreneurial activities successfully (Zhao et al., 2010). Therefore, the hypotheses are:

H4: Perceived behavioral control positively influences entrepreneurial intentions.

H5: Social norms positively influence entrepreneurial intentions.

Previous studies have explained that the idea of social network support and experiences from previous family businesses (Zellweger et al., 2012) have a significant contribution to encouraging entrepreneurship in individuals. This study will look at the impact of social norms on entrepreneurial intention to determine whether there is a link between them. Perceived behavioral control is one of the most significant predictors of entrepreneurial intentions. It is closely linked to the idea of perceived feasibility (Shapero & Sokol, 1982). The former suggests that the subjective norms and attitude of the theory of planned behavior model can be replaced by the perceived desirability of the entrepreneurial event model, while the latter is comparable to Shapero's 1982 model. It was pointed out that although the desire to act is important, it is not the only thing that turns intentions into motives. Thus, the mediating function of perceived behavioral control is the focus of this investigation.

H6: Perceived behavioral control acts as a mediator in the relationship between the performance expectancy of AI solutions and entrepreneurial intentions.
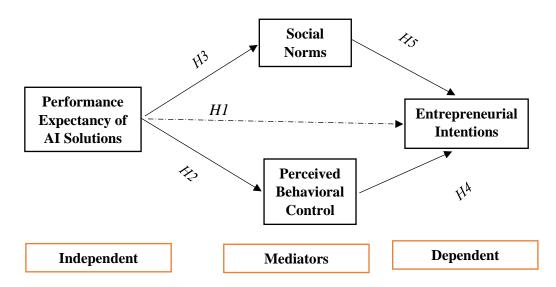

Figure 1. *Research Model*

Entrepreneurial intentions are influenced directly by perceived feasibility, perceived desirability, and perceived opportunity for doing business in the presence of an external environment, which includes an individual's expectations for support from friends and family (Krueger et al., 2000). Researchers, therefore, use models having social norms as mediators to evaluate the relation between entrepreneurial intentions and contextual support factors (Aga & Singh, 2022).

H7: Social norms mediate the relation between the performance expectancy of AI solutions and entrepreneurial intentions.

Research Methodology

This is a quantitative study, and it utilizes questionnaire surveys to answer the research questions. This is a prevalent method because, using this method, sizable data can be collected from large populations in a cost-effective way. One of the advantages of using this strategy is that the data collected is standardized and consistent, which encourages convenient comparison, and the data can be rigorously analyzed using statistical techniques. Data was collected from graduate and undergraduate business students (n = 247) at a well-recognized university in Lahore, Punjab, Pakistan. The students enrolled in a business degree program and those in their last year of graduation were sent an online questionnaire survey using Google Forms. Of the 247 participants, 73 (29.5%) were female, 174 (70.5%) were male, 5 were from graduate programs, and 242 participants were from undergraduate programs. Most respondents were males because Pakistan is a male-dominated society (Abbasi et al., 2022), where males tend to outnumber female students in most Pakistani universities (Lynd, 2007). Purposive sampling was used as a sampling method for this study. A Likert scale was used, which ranged from a scale of 1 to 7. Number 1 referred to a total disagreement, whereas number 7 referred to a total agreement. Validated measures were utilized to measure the variables of this study. A few of the items used in the survey were slightly modified, considering the contextual and cultural factors and to ensure a clear understanding of the items to the study participants.

The data collected was analyzed using Smart-PSL. Also, the hypotheses of the study were tested through PLS structural equation modeling (SEM) using the Smart PLS. To measure reliability, the study used Cronbach (1951), one of the most extensively used methods (Taber, 2018). The study followed a minimum acceptable level of 0.70 reliability to ensure the instrument's internal consistency. Moreover, factor loading was used to measure convergent validity. Also, average variance extracted (AVE), CR, and Fornell-Larcker criterion (Fornell & Larcker, 1981) were also used, along with the heterotrait-monotrait ratio (HTMT) (Ab Hamid et al., 2017). PLS-SEM was used to test the hypothesis and the moderation analysis was conducted using regression analysis. bootstrapping, effect size ($f2$), path coefficients, and coefficient of determinants (R3) were all used to check the moderating effects using SEM.

Results

The analysis was conducted using the data gathered from 247 study participants. Data was collected from graduate and undergraduate business students at a well-recognized university in Lahore, Punjab, Pakistan. The students enrolled in a

business degree program who were in their last year of graduation were sent 500 online questionnaire survey forms using Google Forms. The response rate was around 49.4%. Out of the 247 responses, 174 (70%) were male, and 73 (30%) were female. 23 participants were between the ages of 15 and 19, while most of them, i.e., 174 (70%), were between 20 and 24 years old because most students pursue their undergraduate degrees at this age.

All of the constructions have adequate levels of dependability, as indicated by the table below (Cronbach alpha). Performance expectancy of AI solutions (Artificial Intelligence) has the highest value, with 0.857, followed by entrepreneurial intentions (0.809), social norms (0.753), and perceived behavioral control (0.711). The CR ranged between 0.903 and 0.838, significantly larger than the pre-defined threshold of 0.7 (Moses & Kim, 2015). Moreover, the AVE values ranged between 0.700 and 0.634, which are significantly greater than the threshold level of 0.5, which explains that the latent construct explained much more than half of the variance of the given parameters. The detailed results are mentioned in the table below.

Table 1

Measurement Model

Measurement Model (convergent validity, reliability, discriminant validity)			
Construct	CR	CA (α)	AVE
Entrepreneurial Intentions	0.875	0.809	0.637
Artificial Intelligence	0.903	0.857	0.700
Perceived behavioral control	0.838	0.711	0.634
Social Norms	0.859	0.753	0.670

Discriminant validity was calculated using two methods, including the Fornell-Larcker criterion and HTMT. The HTMT values are suggested to be no more than 0.85; hence, the discriminant validity results displayed in the table below are promising. Similarly, Fornell and Larcker (1981) assert that a construct's square root of the AVE should be larger than its correlation with any other construct, and the results mentioned in the table below display the same fulfillment of the criteria.

Table 2

Correlations and Discriminant Validity

Correlations and discriminant validity by Fornell-Lacker criterion and (HTMT) ratios.				
	AI	EI	PBC	SN
AI	0.836	0.401	0.235	0.235
EI	0.478	0.798	0.506	0.457
PBC	0.296	0.664	0.796	0.310
SN	0.406	0.575	0.413	0.819

Cohen's f2 estimates the impact size in a model where both independent and dependent variables are continuous (Hemphill, 2003). According to Cohen, the effect size of value 0.02 is considered small, and 0.15 is considered medium, and 0.35 is

considered large (Cohen et al., 2014). The following table explains the effect sizes of the constructs which range between medium and small, which is reasonable.
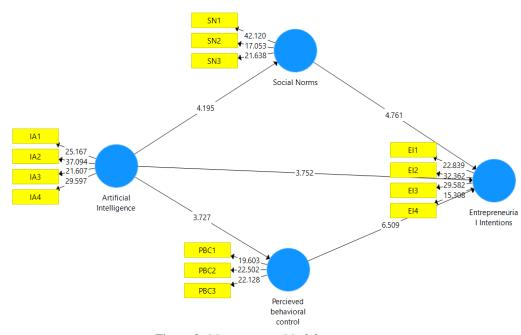
Measurement Model Assessment

Figure 2. *Measurement Model*

Table 3

Effect size - Cohen (f2) f Square

	AI	Size	EI	Size	PBC	Size	SN	Size
			Effect size - Cohen (f2) f Square					
Artificial Intelligence (AI)			0.074	small	0.058	small	0.123	small
Entrepreneurial Intentions (EI)								
Perceived behavioral control (PBC)			0.201	medium				
Social Norms (SN)			0.100	medium				

Using the Bootstrapping in Smart PLS software, the results were obtained for direct relationships presented in the study model. Various tests, including the t-test, were conducted to analyze the relationships. The beta coefficient was also assessed. The path coefficient results using the bootstrapping analysis in Smart PLS are mentioned in the table below.

The result shows evidence through the algorithm and bootstrapping in PLS-SEM that a positive and significant association exists between performance expectancy of AI solutions and entrepreneurial intentions (β = 0.226, t = 3.752, p < 0.05). Therefore, *Hypothesis 1 is supported*. The result shows evidence through the algorithm and bootstrapping in PLS-SEM that a positive and significant association exists between Performance expectancy of AI solutions and perceived behavioral control (β = 0.235, t = 3.727, p < 0.05). Therefore, *Hypothesis 2 is supported.* The result shows evidence through the algorithm and bootstrapping in PLS-SEM that a positive and significant association exists between Performance expectancy of AI solutions and social norms (β = 0.331, t = 4.195, p < 0.05). Therefore, *Hypothesis 3 is supported.* The result shows evidence through the algorithm and bootstrapping in PLS-SEM that a positive and significant association exists between perceived behavioral control and entrepreneurial intentions (β = 0.369, t = 6.509, p < 0.05). Therefore, *Hypothesis 4 is supported*. The result shows evidence through the algorithm and bootstrapping in PLS-SEM that a positive and significant association exists between social norms and entrepreneurial intentions (β = 0.268, t = 4.761, p < 0.05). Therefore, *Hypothesis 5 is supported*.

Table 4
Path Analysis - Hypothesis Testing (Direct effect)

Path Analysis - hypothesis testing (Direct effect)						
	Hypothesis	Coefficient Sample (O)	Coefficient Sample (M)	T	P	Supported
AI -> EI	H1	0.226	0.223	3.752	0.000	Yes
AI -> PBC	H2	0.235	0.240	3.727	0.000	Yes
AI -> SN	H3	0.331	0.331	4.195	0.000	Yes
PBC -> EI	H4	0.369	0.372	6.509	0.000	Yes
SN -> EI	H5	0.268	0.275	4.761	0.000	Yes

The mediating effect is the consequence that emerges between the connection of a predictor and its outcome in the existence of a third variable (Deci, 1971). This research study identifies the mediating impact of perceived behavioral control and social norms between entrepreneurial goals and performance expectancy of AI solutions. The tables below describe the process of identifying the mediation using Baron & Kenny's (1986) approach and the acceptance of mediating and direct hypotheses that were established for this study.

The outcome demonstrates that there is a positive and substantial correlation between the performance expectancy of AI solutions and entrepreneurial inclinations (β = 0.226, t = 0.223, p < 0.05) using the algorithm and bootstrapping in PLS-SEM. Similar to this, there is a strong positive correlation (β = 0.087, t = 3.454, p < 0.05) between entrepreneurial aspirations and performance expectancy of AI solutions in the

context of perceived behavioral control (as shown in step 3 of Baron & Kenny's, 1986). As a result, Hypothesis 6 is validated.

Table 5

Path Analysis - (Specific indirect effect)

	Coefficient Sample (O)	Coefficient Sample (M)	T	P
AI → SN → EI	0.089	0.092	2.800	0.005
AI → PBC → EI	0.087	0.089	3.454	0.001

Table 6

Baron & Kenny's (1986) Approach for Mediation

	Step 1						
	Coefficient Sample (O)	Coefficient Sample (M)	T	P			
AI → EI	0.226	0.223	3.752	0.000			
	Step 2						
	Coefficient Sample (O)	Coefficient Sample (M)	T	P			
AI → PBC	0.235	0.240	3.727	0.000			
AI → SN	0.331	0.331	4.195	0.000			
	Step 3						
	Coefficient Sample (O)	Coefficient Sample (M)	T	P			
PBC → EI	0.369	0.372	6.509	0.000			
SN → EI	0.268	0.275	4.761	0.000			
	Step 4						
	Hypothesis	Coefficient Sample (O)	Coefficient Sample (M)	T	P	Decision	
AI → PBC → EI	H6	0.087	0.089	3.454	0.001	Supported	
AI → SN → EI	H7	0.089	0.092	2.800	0.005	Supported	

*T Value greater than 1.96 shows a significant relationship
*T stats describe how far your observed data is from the Null Hypothesis of No relationship variables

The outcome demonstrates that there is a positive and substantial correlation between the performance expectancy of AI solutions and entrepreneurial inclinations ($\beta = 0.226$, t = 0.223, p < 0.05) using the algorithm and bootstrapping in PLS-SEM. Similar to this, step 3 of Baron & Kenny's (1986) table below shows the positive and significant correlation between entrepreneurial ambitions and performance expectancy of AI solutions in the context of social norms ($\beta = 0.089$, t = 2.800, p < 0.05). Consequently, Hypothesis 7 is validated.

Hence, for the 5 direct hypotheses and 2 mediation hypotheses, all hypotheses received positive empirical support. Both the mediating hypotheses were found to be significantly mediating relationships.

Discussion

The research model of this study analyzed the relationship between the performance expectancy of AI solutions and entrepreneurial intentions. The findings supported this relationship ($\beta = 0.226$, t = 3.752, $p < 0.05$). This result aligns with the existing studies on this subject, where the performance expectancy of AI solutions is found to have a positive and significant influence on the entrepreneurial intentions of individuals (Giuggioli & Pellegrini, 2022). Existing literature suggests that the performance expectancy of using AI solutions is the greatest influence on digital entrepreneurship (Upadhyay et al., 2022). This ultra-modern technology, being so contagious, has affected young entrepreneurs worldwide in developing entrepreneurial intentions (Obschonka & Audretsch, 2020). Empirical studies have proved that fresh graduates get inspiration from high-tech entrepreneurs, stimulating entrepreneurial intentions (Dabbous & Boustani, 2023). AI has triggered entrepreneurial intentions in fresh business graduates, affirming to convert their passion into successful ventures primarily because of the ease of procedures, reliable outcomes, and financial benefits (Wang et al. of et al., 2023). The research model of this study analyzed the relationship between the performance expectancy of AI solutions and perceived behavioral control. The findings supported this relationship ($\beta = 0.235$, t = 3.727, $p < 0.05$). This result aligns with the existing studies on this subject, where the performance expectancy of AI solutions is found to have a positive and significant influence on perceived behavioral control (Giuggioli & Pellegrini, 2022).

The research model of this study analyzed the relationship between the performance expectancy of AI solutions and social norms. The findings supported this relationship ($\beta = 0.331$, t = 4.195, $p < 0.05$). This result aligns with the existing studies on this subject, where the performance expectancy of AI solutions has a positive and significant influence on social norms (Giuggioli & Pellegrini, 2022). Positive outcomes through the usage of AI technologies when they meet society's expectations or exceed them will lead to the evolution of social norms in the form of integration and acceptance of AI in society. The research model of this study also analyzed the relationship between perceived behavioral control and entrepreneurial intentions. The findings supported this relationship ($\beta = 0.369$, t = 6.509, $p < 0.05$). This result aligns with the existing studies on this subject, where perceived behavioral control is found to have a positive and significant influence on entrepreneurial intentions (Giuggioli & Pellegrini, 2022). Moreover, the research model of this study analyzed the relationship between social norms and entrepreneurial intentions. The findings supported this relationship (β

= 0.268, t = 4.761, p < 0.05). This result aligns with the existing studies on this subject, where social norms are found to have a positive and significant influence on entrepreneurial intentions (Giuggioli & Pellegrini, 2022). Studies explain that social network support influences entrepreneurial intentions not independently but as a contributing factor in encouraging entrepreneurship in individuals (Lee et al., 2021).

The research model of this study analyzed that a positive and significant association exists between performance expectancy of AI solutions and entrepreneurial intentions in the presence of perceived behavioral control (β = 0.087, t = 3.454, p < 0.05). AI technology has become a major part of entrepreneurship and has, therefore, become an important factor in theories of entrepreneurship (Townsend & Hunt, 2019). Also, studies reveal that AI is an integral part of evaluating entrepreneurial intentions in individuals (Nabi et al., 2023). AI-related solutions and processes encourage business processes to become more reliable and cost-effective and provide more financial benefits to entrepreneurs; hence, AI and entrepreneurship are closely linked, according to the existing literature.

The research model of this study analyzed that a positive and significant association exists between performance expectancy of AI solutions and entrepreneurial intentions in the presence of social norms (β = 0.089, t = 2.800, p < 0.05). These results are in line with the existing literature where researchers suggest using models having perceived behavioral control and social norms as mediators to evaluate the relation between entrepreneurial intentions and contextual support factors (Aga & Singh, 2022) because it is established that social network support influences entrepreneurial intentions as a contributing factor in encouraging entrepreneurship in individuals (Lee et al., 2021). Moreover, the mediating role of social norms between the performance expectancy of AI solutions and entrepreneurial intentions goes this way if AI solutions are perceived as highly effective by individuals for entrepreneurial activities. Social norms help to convert intentions into actions to start an entrepreneurial venture. On the contrary, negative social norms regarding artificial intelligence and entrepreneurship can lead to an insignificant relationship between entrepreneurial intentions and performance expectancy (Lee et al., 2021).

Conclusion

The study's findings show that social norms and perceived behavioral control—two important antecedents of entrepreneurial intentions have a positive and significant impact on the relationship between people's entrepreneurial intents and their expectations for the performance of AI solutions. This indicates that people who are more likely to want to start their own business are those who think AI-related solutions are valuable. Meanwhile, it was found that the support and encouragement from friends and family to establish entrepreneurial ventures and the self-belief within oneself in

one's abilities to become an entrepreneur in the presence of one's faith in the utility of AI solutions leads toward one's intentions to become an entrepreneur. Social norms mediate the relationship between the performance expectations of AI solutions and entrepreneurial intentions. Specifically, if people believe AI solutions are very effective for entrepreneurship, social norms can help turn those intentions into actions, such as launching a business. The way AI is changing business and technology helps to clarify this relationship. Entrepreneurs frequently look for novel ways to meet market demands, and realizing AI's potential benefits can encourage people to launch AI-related businesses. The increasing adoption of AI across various industries opens new avenues for disruptive innovation, increased productivity, and the creation of innovative goods and services. Entrepreneurs that believe in the potential of AI solutions may be able to recognize opportunities that others would miss, which motivates them to pursue their entrepreneurial goals.

These findings are consistent with previous research and have implications for the body of knowledge and practice through the Theory of Planned Behavior (TPB). These findings are thought to represent an advancement and development of advanced theory in studying entrepreneurial goals.

Limitations and Future Directions

However, the study has some limitations. The first limitation is that the study was conducted with a specific sample of students from the business department so it could not be generalized to the overall population. The results attained will not be an overall societal representation and will not be relevant and applicable to non-business students and the country's youth. Also, the conduction of the research survey at a single location reports a lack of diversity and cannot be a representation of other countries and regions. Furthermore, the sample also lagged diversity in race, gender, and socio-economic status. Hence, the findings cannot be generalized to all. Also, the study did not have any control group, limiting the scope of the research conducted to attribute the observed effects to the variables being studied. These study limitations suggest that further research is required to comprehend better the intricate interplay between AI, social norms, and behavioral control on entrepreneurial intentions.

A comparative analysis is strongly recommended for future studies. In this comparative study, a comparison should be made between the intentions and attitudes of business students, non-business students, and other entrepreneurs. This would offer an extensive evaluation of the aspects that impact entrepreneurial intentions.

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