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THE ROLE OF PERCEIVED ENTREPRENEURIAL THINKING TOWARDS ACADEMIC ENTREPRENEURIAL INTENTIONS: MODERATING ROLE OF ENTREPRENEURIAL ENVIRONMENT

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Abstract

Academic entrepreneurship, loosely defined as programs aimed at developing commercial companies from university research, has been recognized as a crucial engine of innovation and economic growth in recent decades. The underlying objective of current study to evaluate the role of perceived entrepreneurial thinking to predict the academic entrepreneurial with the moderating role of entrepreneurial environment. This study considered the faculty members of public and private sector as respondents and using the PLS-SEM the current study tests the proposed hypotheses. The present study considered the sample of 392 faculty members using the simple random sampling technique. The results affirm that perceived entrepreneurial thinking significantly and positively linked with the academic entrepreneurial intentions. Furthermore, empirical findings affirm that entrepreneurial environment in the academic institutions significantly and positively moderate the relationship between perceived entrepreneurial thinking and academic entrepreneurial intentions. The present study outlines the policy implications for the leadership of academic institutions, regulatory authorities, policymakers, and future research directions for the researchers.

Keywords: Perceived entrepreneurial thinking, entrepreneurial environment, academic entrepreneurial intentions, and partial least square structural equation modelling technique.

Introduction

Pakistani colleges generate roughly 445,000 students yearly, the country's unemployment rate continues to rise compared to other South Asian economies (Zulfqar et al., 2016). Universities in Pakistan need to focus on their third goal, and they must adjust their policy from being an island of knowledge to establishing relationships with external parties through economic operations and commercial research (Akram et al., 2023). The universities in Pakistan currently do not offer commercial research services to the corporate sector and need to work on knowledge creation. The LUMS, for example, has built incubation facilities to stimulate entrepreneurship (Qureshi et al., 2021). Other universities in Pakistan have likewise started building an entrepreneur-friendly environment. In Pakistan, academics predominantly concentrate on technology-driven domains, where university research holds potential for commercializing into marketable innovations (Akram et al., 2021; 2022; Ma et al., 2024). The system of educational system needs to problem solving skills, creative, and well design analytical students are expected to possess (Andleeb et al., 2022). On the other side, many young people are riding the entrepreneurial wave, successfully transforming a company idea into a business. Unsurprisingly, policymakers and academic institutions in developed economies have

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invested considerably in programs to commercialize academic research (Akram & Yang, 2021). In contrast, academic institutions in Pakistan still need to learn how effective and efficient commercialization programs supporting academic entrepreneurship are at spurring innovation and growth.

It is also critical to include the economic perspective when developing an underpinning conceptual framework for academic entrepreneurial intentions (Wurmseher, 2017). Prior literature document the various economic, organizational, institutional, and individual level variables those influence psychological components towards academic willingness to academic entrepreneurial activities (Ferreira et al., 2020). Academic entrepreneurship, loosely defined as programs aimed at developing commercial companies from university research, has been recognized as a crucial engine of innovation and economic growth in recent decades (Siegel & Wright, 2015). A broadening of the strategic scope of institutions has accompanied this development. Rather than only being sources of basic research and trained labor, universities are increasingly recognized as engines for regional and national growth, with a duty to innovate and build businesses (Hayter et al., 2018). Unsurprisingly, institutions (academic) and policymakers have invested considerably in programs to commercialize academic research (Akram, 2020). One of the vital objectives of university administration is to increase "impact" (Secundo et al., 2020). It still needs to be discovered how effective and efficient commercialization programs supporting academic entrepreneurship are at spurring innovation and growth.

As a result, attention is focused on predictors or actors involved in designing the process, policies, support to shape the academic entrepreneurial intention (Neves & Brito, 2020). According to Bird (2002), individuals are driven to entrepreneurial intentions by a combination of personal and contextual factors (entrepreneurial orientation and entrepreneurial thinking), according to Bird's framework for implementing entrepreneurial ideas (knowledge creation) (Hasanah et al., 2023). Entrepreneurial intentions are represented in this conceptual study framework by researchers those involved in process of exploring knowledge for commercial activities (Ozgul & Kunday, 2015). Two underpinning psychological mechanisms were reported in prior literature entrepreneurial event model and theory of planned behaviour employed to achieve the objectives (Davids, 2017; Joshi et al., 2020), its relevance in an academic setting (Wang et al., 2021). The current study intents to benefit university administrations, students, parents, Pakistan's Higher Education Commission, and policymakers by providing advice based on empirical findings. The data for this study will be collected through a survey questionnaire, and the unit of analysis will be individual faculty members.

Literature Review

Perceived entrepreneurial thinking (PET) and academic entrepreneurial intentions (AEI)

The relationship between entrepreneurial thinking and firm performance is well established in prior literature. Several skills and abilities like creativity, revolution, self-motivation, flexibility, and adaptability are chained in entrepreneurial thinking (Alsafadi & Aljuhmani, 2024) for benefiting individuals with different opportunities, such as motivating





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them to think about new ideas at their workplace. A practical and well-organized approach's core and outer matters can be classified by entrepreneurial thinking on an individual and an entire organization (Alqahtani & Uslay, 2020). Skills and entrepreneurial thinking are considered possible components of successful entrepreneurs. As stated in prior studies, entrepreneurial thinking positively influences firm performance. Therefore, entrepreneurial thinking can make a business successful (Alsafadi & Aljuhmani, 2024; Ferreira et al., 2020).

Proven by the studies, it is also true that despite having positive effects, entrepreneurial thinking also has adverse effects because of a higher risk-taking tendency in entrepreneurial behaviour (Ziemianski & Golik, 2020). The impact of the four dimensions of entrepreneurial thinking on intentions to entrepreneurial venture is described. It is known that the scopes of entrepreneurial thinking are linked with entrepreneurial ventures. These dimensions influence entrepreneurial venture (Peschl et al., 2021). As described by prior studies, the risk taking, identifying opportunities, creativity, innovation, and tolerance of ambiguity are the dimensions of entrepreneurial thinking. Entrepreneurial thinking is characterized by unstructured, nontraditional approaches that are not linear but rather focused on differentiation from others (Alsafadi & Aljuhmani, 2024; Hasanah et al., 2023). Idea generation, identification, and control of resources are considered an outcome of the cognitive aspect of entrepreneurs (Taipour et al., 2023). Individuals possessing an entrepreneurial mindset demonstrate the ability to engage in high-level and intricate cognitive processes. Complex and ambiguous cases effectively boost the learning capability of entrepreneurs. Beginning with a robust knowledge base, individuals can discern key concepts and distinguish essential information from trivial details (Chen & Tu, 2021).

Entrepreneurial actions are considered an outcome of the entrepreneurial thinking (Sharma et al., 2024) which entail thorough examination of each project and its business, devising plans grounded in factual insights and prevailing circumstances, tapping into all available support resources, and formalizing a comprehensive plan. Opportunities and threats are considered as an outcome of the assessment of strengths and weaknesses to avoid any failures. Drawing upon the conceptual framework of entrepreneurial thought articulated in prior research and by scholars in the field of entrepreneurship, there is a near consensus regarding the dimensions of entrepreneurial thinking (Klenner et al., 2022). Innovation, creativity and recognition of opportunities is depending on the tolerance of ambiguity and willingness of risk bearing.

H1: The perceived entrepreneurial thinking positively affects the academic entrepreneurial intentions.

Perceived Entrepreneurial Environment (PEE)

Concept of moderators can be introduced in bivariate relationships to make the explanations more robust for understanding of associations (Vij & Farooq, 2017). Review of the literature proves that moderating conditions are present in between the relationship of Entrepreneurial competency and knowledge creation construct (Rehman et al., 2023). It is





EDUCATIONAL RESEARCH AND INNOVATION (ERI)

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Accepted: 09/11/2024

highlighted through empirical studies that climate perception is an important antecedent of academic entrepreneurship behaviour and at other instance said to moderate the relationship of exploration with individuals' own characteristics when taken as determinant (Feola et al., 2021).

It is argued that when entrepreneurial activities are embedded in reward policies the resultant effect on exploitation behaviour performed by academics is manifold (Joshi et al., 2020). In addition, a study by Van Dam et al. (2010) has supported the role of perceptions of entrepreneurial organizational climate as moderator in between competencies of individual teachers and knowledge creation behaviour. That is why with the support of corporate entrepreneurial organizational climate as a moderator between perceived entrepreneurial organizational climate as a moderator between perceived entrepreneurial orientation and knowledge creation behaviour and in between individual competencies and knowledge creation behaviour.

H2: Perceived entrepreneurial environment significantly moderates the association between perceived entrepreneurial thinking and academic entrepreneurial intentions.

The present study uses the psychological empowerment theory which claims that managing the trade-offs between "exploitation" and "exploration" based on the understanding of organization environment and circumstances and characteristics of individuals. Considering the psychological empowerment theory as underpinning theory the present study proposed the academic entrepreneurial intentions depends individual faculty members perception about the perceived entrepreneurial orientation and perceived entrepreneurial thinking (see Figure 1). The prior literature and underpinning theory affirm that entrepreneurial orientation and entrepreneurial thinking are the individual characteristics and emerge as the understanding about the organizational circumstances emerged.



Methodology

To attain the primary goal of this study, we examined the descriptive, correlational, and causative relationship between entrepreneurial thinking, and academic entrepreneurial intention



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and the entrepreneurial environment as a moderating factor between perceived entrepreneurial thinking and academic entrepreneurial intentions. The faculty members of public and private universities in Punjab, Pakistan, were considered as the population of the present study. The present study used the simple random sampling technique to select a sample from the population via collecting the data using a survey-based questionnaire from the faculty members. The study's sample comprises faculty members engaged in or interested in entrepreneurial activity. Furthermore, the current study uses a basic random sampling technique based on the Morgan table, with a sample size of 370 people, to generalize the findings.

We measured academic entrepreneurial intentions as a multi-dimensional construct using 8 items adapted from the existing literature (Johnson et al., 2017). The perceived entrepreneurial thinking was measured as a multi-dimensional construct, and the measurement scale was adapted from the existing literature (Mohamad, 2014). The present study used the same scale to measure the subjective perceived entrepreneurial thinking. Moreover, the perceived entrepreneurial environment was taken as a uni-dimensional construct and measurement scale adapted from the existing literature (Ireland et al., 2009).

Techniques for data analysis

We used structural modelling equation technique to analyze the data, which is regarded as appropriate for testing hypotheses and structural model evaluation (Hair et al., 2021). The reliability and validity of the dimensions were used to evaluate the outer model (measurement model). As mentioned in the previous section, the assessment included formative and reflective measurements. Furthermore, to begin an evaluation procedure, validity and reliability testing were required (Heale & Twycross, 2015). All of the indicators were found to be acceptable and appropriate for assessing internal consistency reliability, referred to Table 1 (Cohen et al., 2017).

Variable	Items	Loadings	CA	CR	AVE	DV
Academic Entrepreneurial Intentions	AEI1	0.631	0.866	0.896	0.624	0.78
	AEI2	0.646				
	AEI3	0.807				
	AEI4	0.778				
	AEI5	0.834				
	AEI6	0.792				
	AEI7	0.491				
	AEI8	0.743				
Tolerance of Ambiguity	TA1	0.911	0.909	0.937	0.788	0.88
	TA2	0.938				



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	TA3	0.874						
	TA4	0.824						
Risk Taking	RT1	0.889	0.933	0.949	0.789	0.88		
	RT2	0.927						
	RT3	0.827						
	RT4	0.9						
	RT5	0.896						
Identifying Opportunities	IP1	0.666	0.927	0.938	0.63	0.78		
	IP2	0.674						
	IP3	0.677						
	IP4	0.668						
	IP5	0.855						
	IP6	0.844						
	IP7	0.838						
	IP8	0.848						
	IP9	0.838						
	IP10	0.822						
Creative and Innovation	CI1	0.903	0.925	0.947	0.817	0.90		
	CI2	0.926						
	CI3	0.899						
	CI4	0.888						
Entrepreneurial	ECL1	0.92	0.94	0.954	0.805	0.89		
Environment	ECL2	0.922						
	ECL3	0.855						
	ECL4	0.889						
	ECL5	0.898						

Findings and Discussion

An inner model is also known as a structural model. This model included two variables: endogenous latent constructs and external latent constructs, shown in figure 2 (Hair et al., 2021). The study's dependent variable is the endogenous construct, whereas the study's independent



variable is the external construct, their results are shown in the hypotheses' pathways (see Table 2).



Figure 2. Measurement Model

Table 2. Hypotheses' pathways

Pathways	Coeff.	S.D	t- values	p- values
Creative and Innovative -> Perceived Entrepreneurial Thinking	0.249	0.014	18.128	0.000
Risk Taking -> Perceived Entrepreneurial Thinking	0.198	0.009	21.12	0.000
Tolerance of Ambiguity -> Perceived Entrepreneurial Thinking	0.205	0.009	22.986	0.000
Identifying opportunities -> Perceived Entrepreneurial Thinking	0.435	0.013	33.346	0.000
Perceived Entrepreneurial Thinking -> Perceived Entrepreneurial Intentions	0.786	0.029	27.391	0.000
Entrepreneurial Environment -> Perceived Entrepreneurial Intentions	-0.116	0.036	3.256	0.001





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Creativity and innovation showed a positive and significant impact on perceived entrepreneurial thinking. Recent literature affirms that encouraging creativity boosts entrepreneurial thought processes (Anjum et al., 2020). Moreover, the empirical findings indicate that identifying opportunities significantly and positively influence the entrepreneurial thinking and clearly indicate the significance of spotting opportunities in entrepreneurial development. The findings of current study well aligned with prior literature which affirms that spotting opportunities significantly and positively linked with the entrepreneurial venture creation (Chavoushi et al., 2021). Given this, universities should organize workshops and training programs that focus on creative problem-solving and innovation. Encouraging interdisciplinary collaboration can further stimulate innovative ideas by blending diverse expertise. Additionally, institutions should provide seed funding for experimental projects, enabling faculty to explore and test creative concepts in a risk-free environment.

Furthermore, willingness to take risks positively influences perceived entrepreneurial thinking, suggesting that risk tolerance is vital in fostering entrepreneurial attitudes. Moreover, the findings of current study well aligned with prior literature which indicate that risk taking significantly and positively associated with the perceived entrepreneurial intentions through the entrepreneurial thinking (Shahzad et al., 2021). In addition to that the empirical findings indicate that tolerance of ambiguity significantly and positive predict the perceived entrepreneurial thinking, which affirms that importance of comfort with uncertainty in entrepreneurial thought. The empirical findings of current study well aligned with prior literature which indicate that tolerance of ambiguity significantly and positively predict the entrepreneurial intentions (Durnali tolerance of ambiguity significantly and positively predict the entrepreneurial intentions (Durnali et al., 2023). In this regard, Universities should offer training on risk management to build confidence in taking calculated risks. Recognizing and rewarding faculty members who engage in entrepreneurial ventures, even if they encounter setbacks, can normalize risk-taking and reduce the stigma of failure (Li & Akram, 2023; 2024). Additionally, introducing incentive programs that reduce financial or career risks can motivate faculty to explore entrepreneurial opportunities.

In addition to that findings indicate that perceived entrepreneurial thinking is a key driver of entrepreneurial intentions, strongly and positively impacting the willingness to pursue entrepreneurship. The empirical findings of present study support the existing literature which indicate that entrepreneurial thinking significantly and positively linked with perceived entrepreneurial intentions (Vuorio et al., 2018). The entrepreneurial environment negatively affects perceived entrepreneurial intentions, this could indicate the significance of challenges or limitations or contextual barriers in the environment discourage entrepreneurial intentions. The earlier studies claim that the in the presence of contextual barriers, issues and challenges probability of entrepreneurial venture creation significantly reduced the empirical findings of current study aligned with prior literature (Nguyen, 2020). Therefore, incorporating modules on opportunity recognition in faculty development programs and entrepreneurship training are seen essential. Networking events that connect faculty with industry professionals can provide real-

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world insights and facilitate the identification of entrepreneurial opportunities. Universities can also establish channels to share market trends, technological advancements, and funding opportunities to support opportunity recognition.

The empirical findings of current study indicate that a negative but significant relationship exists between entrepreneurial environment and perceived entrepreneurial intentions, suggesting an unfavorable environment may reduce intentions. The findings of current study are well aligned with prior literature which claims that unfavorable environment significantly reduces the chances of entrepreneurial venture (Vuorio et al., 2018). Furthermore, the entrepreneurial thinking positively and significant driver of perceived entrepreneurial intentions. However, the empirical findings in case of moderation indicate that entrepreneurial environment significantly and positively moderate the relationship between perceived entrepreneurial thinking and perceived entrepreneurial intentions (see Table 3 & figure 3). The findings of the current study aligned with prior literature which claims that entrepreneurial environment is positively and significantly linked with perceived entrepreneurial intentions (Esfandiar et al., 2019). Thereby, Universities can form partnerships with governmental and nongovernmental organizations to improve the overall entrepreneurial ecosystem. Developing support systems tailored to the unique challenges faced by faculty in Pakistan, such as cultural attitudes and regulatory constraints, will help mitigate environmental barriers. Offering rewards and incentives for faculty who engage in entrepreneurial initiatives despite challenges can further encourage participation.

Pathways	Coeff	S.D.	t-values	p-values
Entrepreneurial Thinking -> Perceived Entrepreneurial Intentions	0.546	0.063	8.627	0.000
Creative and Innovative -> Perceived Entrepreneurial Thinking	0.249	0.014	17.810	0.000
Identifying opportunities -> Perceived Entrepreneurial Thinking	0.435	0.013	33.100	0.000
Risk Taking -> Perceived Entrepreneurial Thinking	0.198	0.009	21.229	0.000
Tolerance of Ambiguity -> Perceived Entrepreneurial Thinking	0.205	0.009	23.086	0.000
Entrepreneurial Environment -> Perceived Entrepreneurial Intentions	-0.118	0.046	2.573	0.010
Moderating Effect 1 -> Perceived Entrepreneurial Intentions	0.006	0.035	0.162	0.871

Table 3. Moderation Analysis



Figure 3. Structural Model

Conclusions

This study provides valuable insights into the factors shaping academic entrepreneurial intentions among university faculty in Pakistan. The findings underscore the critical role of perceived entrepreneurial thinking as a driver of entrepreneurial intentions, emphasizing the need to foster creativity, innovation, opportunity identification, risk-taking, and tolerance for ambiguity to encourage entrepreneurial mindsets. The study highlights that creativity and innovation significantly enhance entrepreneurial thinking, reinforcing the idea that fostering innovative capacities is fundamental to entrepreneurial development. Similarly, the ability to identify opportunities emerges as a key factor, showing the importance of equipping faculty with tools and knowledge to spot and leverage entrepreneurial possibilities. Furthermore, Risk-taking and tolerance for ambiguity are shown to positively influence entrepreneurial thinking, suggesting that a willingness to navigate uncertainty and take calculated risks is essential for fostering entrepreneurial behavior. Faculty members with higher comfort levels in uncertain and challenging situations are more likely to exhibit entrepreneurial thinking and intentions. While perceived entrepreneurial thinking significantly drives entrepreneurial intentions, the findings reveal that the entrepreneurial environment negatively affects intentions. This indicates that contextual barriers, such as institutional challenges or lack of support, discourage entrepreneurial aspirations among faculty. However, the moderating effect of the entrepreneurial environment suggests that when environmental factors are supportive, they can amplify the positive relationship between entrepreneurial thinking and intentions. In conclusion, the study



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demonstrates that perceived entrepreneurial thinking is a pivotal factor influencing academic entrepreneurial intentions. Although unfavorable environmental conditions present challenges, fostering a supportive entrepreneurial ecosystem can mitigate these barriers and enhance entrepreneurial outcomes. The findings provide a foundation for policymakers, university administrators, and educators to develop targeted strategies to promote entrepreneurship in academia, ultimately contributing to the growth of innovation-driven economies.

Limitations

Every research endeavor creates a space for future investigators to uphold the tradition of exploration by venturing into novel areas. Likewise, this study also left some gaps, which are considered a limitation of this study. The study's constraints lie in the fact that there is no imperative need for the research interest or capabilities to be exclusive to faculty members. This study needs the research viewpoint of non-faculty employees of the universities, who are also qualified. However, due to higher management's focus on the faculty members, the non-faculty or managerial positions employees need to be included. Demographic characteristics and comparative analysis are absent in this study, which hinders the differentiation of respondents' intentions based on gender, age, and education. Previous studies utilized gender or age in different roles that identify whether females or males are more inclined towards entrepreneurship or are the risk-averse gender in this area. Age and experience play a determining role in identifying the age group more inclined to take the initiative to join an existing venture or embark on a new entrepreneurial endeavor. Creativeness also depends upon age; most organizations hire new and young people to take innovative ideas towards creativity.

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