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## Article

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Article

# Linking Proactive Personality and Entrepreneurial Intentions: A Serial Mediation Model Involving Broader and Specific Self-Efficacy

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**Abstract:** Entrepreneurial intention (EI) has been widely cited as one of the foremost predecessors of entrepreneurship which fosters business opportunities to minimize the dependence on employment. Since it is worth noticing how one's EI is formed; therefore, the prime purpose of this paper is to estimate the underlying concepts of proactive personality (PP) in establishing potential entrepreneurs' EI through the mediating role of both specific self-efficacy and broader self-efficacy. This research investigates the parallel mediation and the role of mediators in the form of a series between PP and EI via broader self-efficacy and specific self-efficacy. The extant research employed a quantitative methodology by using a self-administered questionnaire technique. Data were collected using the cluster sampling technique from a sample size of 700 respondents in the higher education sector. To test the measurement and structural modeling, the PLS-SEM technique was deployed using Smart PLS 2.0 M3 software. Regarding the direct relationships, findings infer that PP is positively associated with three broader forms of self-efficacy, which determine specific self-efficacy. Findings indicated that broader forms of self-efficacy and specific self-efficacy play the role of the serial mediators in the relationship between proactive personality and entrepreneurial intentions. The research carries important implications for the university policymakers in Pakistan to develop their self-reliant "business incubation centers", initiate experiential learning-based projects, improvise competency-based curriculum, design innovative projection techniques, and follow open innovation dynamics to establish an entrepreneurial culture.

**Keywords:** proactive personality; learning self-efficacy; entrepreneurial intentions; creative self-efficacy; entrepreneurial self-efficacy; leadership self-efficacy

## 1. Introduction

The endorsement of entrepreneurship has become dramatically an essential part of the growth in both underdeveloped and developing countries [1]. The education sector has suggested that entrepreneurship is a significant contributor in generating business opportunities to minimize the dependence on employment. According to past studies [2], academia and entrepreneurship are closely related to each other, thereby, educational institutes may play an effective role in promoting young innovative entrepreneurs in their country, but the question arises as to how they can produce entrepreneurs? The response delineates finding the factors that can influence an individual's entrepreneurial intentions in diverse multi-cultural contexts.

The entrepreneurial intention has strong predictive power for determining one's behavior and it is formerly affirmed that entrepreneurial intention, hereafter referred to as EI, is a predecessor

of entrepreneurship [3,4]. Nevertheless, how an individual's intention is formed has still been subject to query in the field of entrepreneurship. All over the globe, entrepreneurship is assumed to be a significantly suitable alternate to employment amongst educated people. This belief can be attributed to various reasons, to name a few: First, well-educated people are more likely to be successful entrepreneurs in their future career. Educationists and consultants enforce the importance of educating on entrepreneurship in business establishment [5]. Second, in a knowledge conducive era, organizational structure and technology transformation are occurring rapidly. This, in turn, impedes the number of employee rewards in both medium and large-sized organizations subsequently raising the mandate for producing employers rather than employees [6]. Third, the world economy is going through a troubled period and a zero-growth rate. More recently, scholars advocate the notion of government interventions in creating an entrepreneurial state by applying open innovation dynamics and innovative business models [7].

Indeed, these aforementioned two main reasons are also valid in the context of Pakistan whereby, companies are undergoing holistic restructuring, mergers, joint ventures and consequently producing workforce layoffs, unpaid leaves, and terminations. Private jobs are highly insecure and qualified people are forced to do less privileged jobs. Increasing the rate of unemployment among young people in underdeveloped countries in recent years calls for a robust solution. For instance, according to a statistical census unemployment rate in Pakistan is 5.55%. As per the calculations of financial consultants, it will further intensify in the succeeding years [8].

The high unemployment rate is becoming a major cause of increasing crime rates in Pakistan [9]. It is promoting lubricative grounds for other undesirable social crimes, including theft, robbery, suicide, target killing, and terrorism at the risk of foreign trades. Such crimes are adversely influencing the economic condition of Pakistan [10]. In this depressing realm, the academic institutions in Pakistan, in particular, should take the initiative to produce entrepreneurs and instill motivation in students to become entrepreneurs. Entrepreneurs may solve the unemployment and economic crisis through job creation and contribute pragmatically to the country's economic development [11].

Zhao et al. [12] showed that little is understood about the theoretical contribution of entrepreneurial self-efficacy in determining the predecessors of entrepreneurial intentions. Therefore, the study responds to the call of Zhao et al. [12] while measuring the mediating role of entrepreneurial self-efficacy in the relationship between proactive personality and entrepreneurial intention. Furthermore, In the present study, the idea of entrepreneurial feasibility was extended by underscoring three broader self-efficacy beliefs encompassing learning self-efficacy (LSE), creative self-efficacy (CSE), and leadership self-efficacy (LDSE) based on a generative view of self-efficacy. By adding LDSE as a determinant of entrepreneurial self-efficacy (ESE) this study attempts to respond to the call of Fuller et al. [13]. Endeavors to foreground the intervening variables contributing to the association between PP and EI are still in infancy and require a deeper understanding of the complex mechanism.

Tough, sufficient studies are well notably cited that concentrated their attention on investigating the role of personality factors towards developing one's EI but these were primarily delineated the direct effects of PP on EI. However, the existing research attempts to bridge the theoretical gap by assimilating specific self-efficacy and three broader forms of self-efficacy as highly significant serial mediators between the PP and EI relationship. Therefore, the aim of the paper is to find the predecessors and the underpin the pathways to EI by exerting substantial consideration of the mediating variables (broader and specific forms of self-efficacy) among Pakistani university students. This research also attempts to measure CSE, LSE, and LDSE as parallel mediators between PP and ESE to unfold the intact query.

In order to achieve the set objectives, the current paper presents five sections. The first section entails an introduction followed by the literature section. In the literature review, constructs are operationalized and the hypotheses are postulated. The third section is mapped on materials and methods which encompass details on the population, sample techniques, data gathering procedure, and instruments and measurement. The fourth section outlines data analysis and results which exhibit

the measurement model and structural model. The last section offers a discussion to compare the results with other similar studies. It also delivers significant theoretical contributions and the conclusion which is further divided into implications, limitations, and future directions.

## 2. Literature Review

### 2.1. Proactive Personality (PP) and Entrepreneurial Intentions (EI)

The concept of proactive personality is related to the entrepreneurship domain since entrepreneurs deliberately evaluate the external environment and identify evolving opportunities to establish innovative ventures [14]. Earlier researches provide empirical evidence that one's proactivity is positively and significantly related to EI [15]. In another study, it is proclaimed that personality has a noteworthy contribution to portraying one's EI [16]. On the basis of the criterion of proactivity, individuals can be characterized among personalities, for example, to predict who will be more appropriate for entrepreneurial ventures. This is observed as the PP influence on EI. The results proposed that the people's extent of proactivity is strongly linked with various kinds of entrepreneurial behaviors such as introducing the business, the number of ventures, and the form of ownership [17]. On the basis of the aforesaid discussion, the following hypothesis is manifested.

**Hypothesis (H1).** *There is a significant positive relationship between PP and EI.*

### 2.2. Proactive Personality (PP) and Creative Self-Efficacy (CSE)

Creativity, which alludes to the improvement of novel and valuable thoughts, is firmly identified with individual development [18]. More recently, it is found that proactive people will in general effectively take part in looking for new open doors in their workplace that can result in advancement and creative results [19]. Additionally, proactive people are stimulated to refresh their insights and aptitudes and distinguish new work forms than inactive individuals [20]. Moreover, past investigations have revealed that proactive people, who are most certain, have both optimistic emotional understandings and a high level of CSE at work [21]. Proactive persons are perceptively considered as an antecedent of CSE [21].

It is presumed that self-based inner determinants and outer relevant determinants are two classifications of variables connected to CSE [22]. Furthermore, earlier studies have confirmed that proactive personal traits and a person's creativity are significantly and positively related to each other [21,23]. It is observed that more proactive people ought to have a more noteworthy feeling of self-assurance and CSE in their work lives [13]. Based on a similar vein, the present examination intended to explore the link between PP and CSE.

**Hypothesis (H2).** *There is a significant positive relationship between PP and CSE.*

### 2.3. Creative Self-Efficacy (CSE) and Entrepreneurial Self-Efficacy (ESE)

Scholars have established a strong connection between creativity and enterprise development in a series of studies. In fact, innovative ideas are shaped in an environment where there are ample opportunities to avail the required amount of information clearly and freely [24]. These creative ideas represent the nature of creativity and stimulate the individual to initiate a new entrepreneurial venture [25]. Creativity is an integral component particularly at the initial stages of the entrepreneurial process since it underwrites the production of novel products and services [26]. Thereby, people with higher perceived creativity are more probable to form their own establishments; this validates the conclusions of prior academics who have declared that entrepreneurship is the outcome of creativity. Creative pursuits need some inner kind of supporting force that encourages people to endure in the dominion of the challenges inherent to creative work [18].

Creativity is understood as a significant ingredient to entrepreneurial behavior because it is connected with the recognition of opportunities that give rise to the creation of new firms or even new industries [27]. Since ESE includes several creativity-related facets within the entrepreneurial field, CSE should produce perceptions of entrepreneurial ability that drive one's ESE. Thus, the subsequent hypothesis is formulated.

**Hypothesis (H3).** *There is a significant positive relationship between CSE and ESE.*

#### 2.4. Mediating Role of Creative Self-Efficacy (CSE) between Proactive Personality (PP) and Entrepreneurial Self-Efficacy (ESE)

Proactive persons search for future prospects, exhibit ingenuity, take action, feel confident, and persist until they create change [21]. Entrepreneurs' self-efficacy can arise, partially, because of their CSE or the confidence that an individual has the capability to submit creative results [22]. CSE is positively related to the development of innovative creative behavior, and valuable ideas [22,28]. Creativity is supposed to be significant to the entrepreneurial process as creativity is related to opportunity identification and the startup of innovative products and services [29] as well as business innovation [30].

Entrepreneurial competence is contingent on one's ability to occupy multiple job roles and being career-oriented [31] which is also an attribute of PP. Recent research expresses that proactive individuals exhibit creativity in their work activities [19]. Those with high CSE can utilize enough enthusiasm, mental resources, and strategies required to fulfill the standard of being an entrepreneur [32]. Recent research has found that CSE partially mediates between PP and ESE relationship [13]. Concerning the intervening variables between the direct causal connection between PP and individual creativity, more current investigation has exposed the influence of a proactive individual on creativity via a personality's inherent attitude, including self-efficacy and intrinsic motivation [33].

**Hypothesis (H4).** *The relationship between PP and ESE is mediated by CSE.*

#### 2.5. Proactive Personality (PP) and Learning Self-Efficacy (LSE)

Little is understood regarding personality differences that could impact one's self-efficacy, the latest research provides shreds of evidence to the models that cover many elements of learning about goals impact self-efficacy. Meanwhile, individuals with PP are more dedicated to their task [34]. According to Lafontaine et al. [35], the inspiration for learning, which includes the longing to take part in development and training helps in the improvement of individual self-efficacy, and to grasp the preparation experience.

Personality factors are moderately consistent and steady and have singular attributes that demonstrate general inclinations and feelings. These tentative factors might be particularly imperative in producing motivation to such situations and these situational factors such as (training atmosphere, the absence of social support), apply a minimal negative or positive effect on the motivational behavior for learning [36]. It is proclaimed that an individual with proactive behavior is more personalized in learning new things, his level of motivation is higher than others [37]. Proactive people are confident in their ability to learn, ready to act, adhere to qualities that are vital to models of self-confidence [38]. Hence, the following hypothesis is postulated.

**Hypothesis (H5).** *There is a significant positive relationship between PP and LSE.*

#### 2.6. Learning Self-Efficacy (LSE) and Entrepreneurial Self-Efficacy (ESE)

Numerous studies have established that self-efficacy is crucial for an entrepreneur to achieve logical reasoning because entrepreneurs should have the confidence and ability to keenly observe and think about how to solve problems, to choose a course of action, and to adequately answer a given

question to achieve logical and rational conclusions [39]. Cognitive exploration of the avenue of entrepreneurship also comprises of investigating, measuring, evaluating, and cognitively establishing entrepreneurial probabilities [40]. Individuals who have confidence and self-awareness of their abilities, tend to have more cognitive stimulation to observe, learn, and critically think to find several creative ways to become an entrepreneur. So, that leads to the postulation of the following hypothesis.

**Hypothesis (H6).** *There is a significant positive relationship between LSE and ESE.*

#### 2.7. Mediating Role of Learning Self-Efficacy (LSE) between Proactive Personality (PP) and Entrepreneurial Self-Efficacy (ESE)

The confidence of learning activities related to business creation, reasoning, managing, and sustainable advantage before establishing ESE and the belief of being talented is indispensable for potential entrepreneurs [41]. Proactive persons tend to be confident in their learning and adapting skills to enhance and develop their entrepreneurial self-efficacy. For instance, highly proactive personalities are persuaded to take advantage of being motivated and determined to learn an ability [37] and their LSE will help them in developing entrepreneurial self-efficacy. It was evaluated in Fuller, Liu, Bajaba, Marler, and Pratt's [13] study that proactive personalities and abilities to learn self-efficacy are positively inter-correlated with ESE.

**Hypothesis (H7).** *The relationship between PP and ESE is mediated by LSE.*

#### 2.8. Proactive Personality (PP) and Leadership Self-Efficacy (LDSE)

Proactive personalities are positively correlated with an individual's professional success [42]. Moreover, this professional success indicates that employees who have high proactive personalities are more probably upgraded or ranked at higher positions of leadership [43]. To differentiate new leadership roles from old roles, new positions entail that proactive people highlight their struggle to encourage their juniors and to attain achievement as an entire team. On the contrary, in a competitive and indeterminate business environment, leaders are also endeavoring to apply practical, proactive intentions and lead positive inventions to their firms in order to guarantee team success and survival [15]. Highly proactive personality-oriented leaders are motivated to take actions that are significantly continued to bring drastic changes to the environment by taking self-initiated and goal-oriented actions [21]. It is evaluated in research that, proactive leaders appreciate individual performances by setting striving, go-getting team goals, and challenging environment [43].

**Hypothesis (H8).** *There is a significant positive relationship between PP and LDSE.*

#### 2.9. Leadership Self-Efficacy (LDSE) and Entrepreneurial Self-Efficacy (ESE)

The entrepreneurial leader encounters such opportunities which encompass generating a vision and a team capable of endorsing that vision. The two critical challenges of developing a vision and establishing a capable and engaged team are interrelated to each other since the former construct is unusable without the latter construct [44]. Entrepreneurs with leadership skills visualize, endorse, and transfer the information of a firm efficiently [45]. The leadership skill in an entrepreneur is much common and transforms others and by doing so, the leader sets an example for the followers [44].

Leaders also encountered a conventional cognitive approach and risk-averse behaviors from followers. Such attitudes from followers are produced due to their lack of confidence in the rewards in an unpredictable environment [44]. Based on the assertion of the SEE approach, inertia drives one's behavior unless some external forces impact to intrude the on inertia [46]. So, leaders must have leadership qualities to inspire, motivate, and engage others to obtain entrepreneurial outcomes. The leader should possess high LDSE to turn out to be a proactive, self-confident, and effective entrepreneur.



**Hypothesis (H9).** *There is a significant positive relationship between LDSE and ESE.*

#### 2.10. Mediating Role of Leadership Self-Efficacy (LDSE) between Proactive Personality (PP) and Entrepreneurial Self-Efficacy (ESE)

Entrepreneurial leaders unleash new realities, explore the unknown, and endure to form the future vision. Mere intelligence does not guarantee that one will become an entrepreneurial leader but an entrepreneurial leader also requires having favorable contextual and family factors. A primary factor that is considered to govern victory is the entrepreneur's ability to handle opportunities through organizational factors, thus encouraging followers to engage themselves proactively [47].

An entrepreneur needs to bring something new, unique, and evocative to problems. An entrepreneurial leader with a risk-taking ability has the inclination of scanning current opportunities for problem-solving and less possibility to fail [31], which is a key characteristic of proactive personalities. Proactiveness is related to establishing and executing projects and events through suitable ways, which dramatically embraces the efforts of the whole team [47]. The leader should possess interpersonal skills so that they may exert influence on their team to achieve the set entrepreneurial milestones. Thereby, the below said hypothesis is formed.

**Hypothesis (H10).** *The relationship between PP and ESE is mediated by LDSE.*

#### 2.11. Entrepreneurial Self-Efficacy (ESE) and Entrepreneurial Intentions (EI)

Scholarly work has provided the notion that ESE distinguishes entrepreneurs from those who are not entrepreneurs, and findings have delineated that ESE is a predecessor of EI [48]. This construct can be demarcated as the intensity of a person's inner confidence that he can efficaciously accomplish the job of an entrepreneur [49]. Another study observed the linkage between ESE and persistence, discussing that ESE can enable creators more obsessive about formulating, launching, and emerging businesses [50]. Entrepreneurial self-efficacy increases the belief in entities' ability to strategize and to extract benefits through a formal plan [51].

ESE is one of the basic requisites of people who want to be entrepreneurs [52]. Though, individuals with high self-efficacy estimate the business market as full of opportunities and are successful in understanding positive outcomes [11] while others with low self-efficacy estimate the same market as occupied with hindrances. In this way, perceived self-efficacy influences feasibility first and outcomes of intentions finally [40]. The above discussions are helpful to formulate the following hypotheses.

**Hypothesis (H11).** *There is a significant positive relationship between ESE and EI.*

**Hypothesis (H12).** *ESE mediates the relationship between PP and EI.*

**Hypothesis (H12a).** *CSE and ESE are serial mediators in the relationship between proactive PP and EI.*

**Hypothesis (H12b).** *LSE and ESE are serial mediators in the relationship between PP and EI.*

**Hypothesis (H12c).** *LDSE and ESE are serial mediators in the relationship between PP and EI.*

#### 2.12. Proactive Personality (PP) and Self-Efficacy (SE)

People with a proactive personality employ an enlarged degree of self-efficacy in their job careers [42,53]. Though, it is admissible that a positive relationship exists between PP and self-efficacy [21]. However, there is relatively insufficient evidence provided that highlights the linkage between PP and self-efficacy. Proactive people possess positive characteristics and certain working behavior, for instance, self-efficacy, self-confidence, and work engagement [20], that consequently enforces functional results [53]. Other authors advocate that PP has the strength to influence work behaviors and outputs via self-efficacy [50].

**Hypothesis (H13a).** *There is a significant positive relationship between PP and SE.*

### 2.13. Self-Efficacy (SE) and Entrepreneurial Intentions (EI)

Self-efficacy is being continually considered an explanatory construct to determine why individuals endure for particular assigned tasks and persevere their exertions to obtain goals [54]. The construct of self-efficacy is widely discussed in connection with the arena of entrepreneurship, therefore, the relationship between self-efficacy and EI is being studied [50]. Piperopoulos and Dimov [55] established that a higher level of self-efficacy drives a greater sense of EI. Likewise, it is pronounced that self-efficacy has strong power to predict EI [4,39].

Self-efficacy affects an individual's confidence to finish the current work activities while providing direction for future actions [35,56]. Deciding on a career path is a tough decision that requires a superior level of self-efficacy [53]. Selecting among available career alternatives is not possible without the active role of self-efficacy that needs deep cognitive thinking [54,57]. Self-efficacy is an influential personal characteristic that plays an imperative role during multiple phases of developing an entrepreneurial venture [17,48]. It is predicted that people with a high level of self-efficacy are more likely to have the self-confidence to introduce change, and they may be more capable of regulating their own thinking progression and behaviors [11,57]. Thus, based on assertion, it is believed that there is a positive and significant link between self-efficacy and EI [4].

**Hypothesis (H13b).** *There is a significant positive relationship between SE and EI.*

### 2.14. Mediating Role of Self-Efficacy (SE) between Proactive Personality (PP) and Entrepreneurial Intentions (EI)

Previous literature persists to claim that a mediating role of motivational elements exists between the relationship of personality factors and entrepreneurial activities [11,58,59]. Thus far, a fewer number of studies exert their attention towards considering the interplay of mediators in the domain of entrepreneurship [14]. In the same way, earlier scholars explained that researches on the collective impact of PP and ESE on EI are limited and need to be examined further [60–62].

To cite a few, earlier research concluded that self-efficacy acts as a mediator between the association of risk-taking (personality factor) and EI [12]. Some others claimed that self-efficacy partially mediates between the connection of individual characteristics and EI [39]. Another study empirically proved in a sample of business university students that self-efficacy acts as a mediator between the association of PP and EI [23]. Additionally, it has been declared that self-efficacy fully mediates between EI and PP linkage [63,64]. Assuming self-efficacy as a motivational phenomenon [58] and the continuing debate on whether self-efficacy partially or fully mediates between the EI and PP relationship following hypothesis is established.

**Hypothesis (H13c).** *Self-efficacy mediates the relationship between PP and EI.*

### 2.15. Theoretical Framework

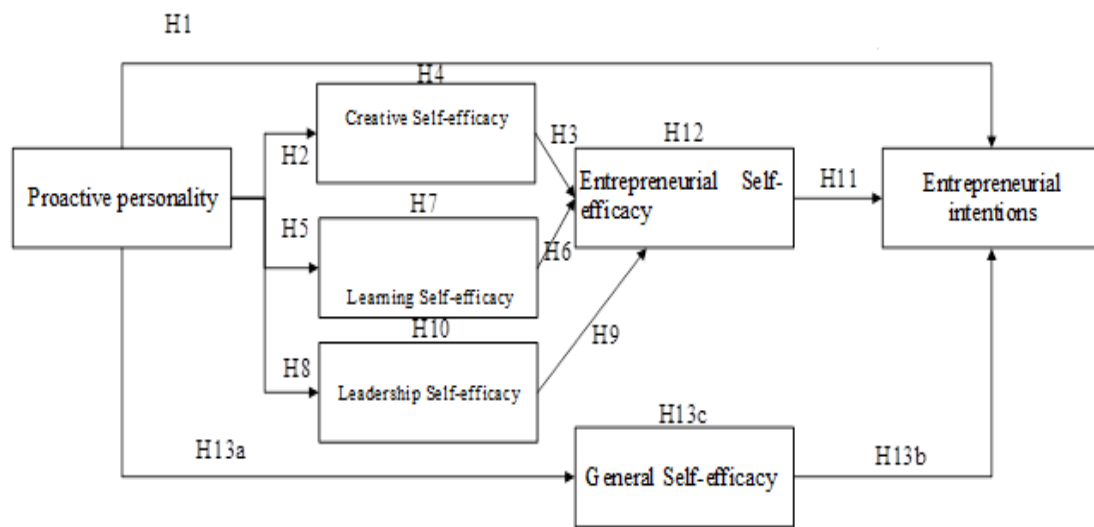
The main objective of the paper is to find the underpinning pathways from PP to EI, in the case of university students in Pakistan. To accomplish this task, the overall analytical framework for the study was developed based on two established theories: (1) social cognitive theory [57,65] (2) theory of planned behavior (TPB) [66].

Based on the assertion of the theory of planned behavior (TPB), one's intention to be involved in a specific behavior is the instantaneous factor of belief [67]. Proactive students having a belief in their broader self-efficacy beliefs (CSE, LSE, LDSE) and specific self-efficacy beliefs (ESE) will be encouraged to initiate their own business. Proactive students will assume establishing a business to reduce unemployment will be appreciated and supported by society. They may perceive that they can



act like an entrepreneur by controlling their behaviors. Thus, TPB factors are necessary to bring about EI among proactive university students.

Underpinned with social cognitive theory, people cognitively find the ways through which they are likely to chase rigorous entrepreneurial activities. Potential entrepreneurs may test assumptions, utilize previous experience, predict various features of successively doing business, and attempt to explore hidden obstacles to establish a new business. Cognitive thinking of the dominion of entrepreneurship also embraces the scanning environment, judging, and cognitively building entrepreneurial prospects [40]. In view of a social cognitive paradigm, the more one has confidence in his talent to efficaciously perform the responsibilities and job of an entrepreneur the more likely he will endeavor to become an entrepreneur [12]. Thus, one having a greater sense of ESE has more chances to select the entrepreneurial setting than others with a lower level of ESE. Thus, the model represented in Figure 1 shows that PP affects EI through mediating the intervening play of broader self-efficacy beliefs, general self-efficacy, and specific self-efficacy beliefs.



**Figure 1.** Conceptual Model.

### 3. Materials and Methods

#### 3.1. Population, Sample Techniques, and Data Gathering

The study used a positivism research paradigm and deductive research approach. Aligned with the research design and philosophy, a quantitative self-administered survey questionnaire was used to collect data from university students in universities. In total, 1000 questionnaires were distributed in universities of the main cities of Pakistan including Lahore, Faisalabad, and Gujranwala, and 747 were received back, showing a 74.7% response rate. Of these, 700 questionnaires were explicitly retained for detailed analysis after deleting the cases which included unengaged responses and missing values consequently, providing a 70.0% response rate. Those students were selected who had studied or were studying the entrepreneurship course as part of their curriculum. Data analysis and path modeling were done by using structural equations modeling (SEM) methods—partial least squares (PLS) by using Smart PLS 3 (M3) software.

There are several reasons why this research employed the PLS method to perform path analysis and test relationships. First, SEM has been represented as the most contemporary approach that conducts assessments better than hierarchal regressions to test mediation analysis [68]. This has been evidently proved that PLS-SEM better deals with measurement error and provides a more accurate assessment of mediating relationships. Second, PLS path analysis enables itself to be adequate for the applied scenarios and comparatively more advantageous to be used in case of complicated research models and entrepreneurship domains. Third, the PLS-SEM method does not supply rigid conditions,

such flexible assumptions of the PLS technique let researchers formulate and establish complicated conceptual models thereby, testing large complex models with ease. Fourth, the PLS approach does not provide conditions for data normality, which could be a potential problem [69].

### Sampling Techniques

The data were obtained through the cluster sampling technique. Multi-stage sampling was adopted and encompassed three stages. Firstly, the population was divided into five clusters, and three clusters (Faisalabad, Lahore, Gujranwala) were selected randomly. Second, within each cluster (city) universities were designated by using a simple random sampling technique. Third, within each university, students were selected by using a simple random sampling technique. Since the selected sample size is less compared to the numbers of total university students, this study needs to sample only a few, say two, universities (subdivisions) for each cluster.

### 3.2. Instrument and Measurement

The response was obtained through a self-administered questionnaire comprising 52 items from university students using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) on all 10 variables. The present research employed self-administered questionnaires that comprised of 52 items for data gathering from respondents (Table 1).

**Table 1.** Sources of measurement items.

	Construct	Scale	Items	Sample Item
Exogenous Variable	Proactive personality	PP scale [70]	10	"I am constantly on the lookout for new ways to improve my life."
Endogenous variable	Entrepreneurial intentions	EI scale [71]	6	"I am ready to do anything to be an entrepreneur."
	Entrepreneurial self-efficacy	ESE scale [27]	9	"I can recognize potential customers"
Mediating Variable	Creative self-efficacy	CSE scale [72]	7	"I come up with many possible solutions to a problem."
	Learning self-efficacy	LSE scale [73]	6	"I am able to plan the activities to meet the work-related deadlines."
	Leadership self-efficacy	LDSE scale [74]	6	"I always preferred to start and lead change processes in groups."
	Self-efficacy	GSES scale [75]	8	"I can achieve most goals that I set for myself."
Total Items			52	

## 4. Data Analysis and Results

### 4.1. Measurement Model

As per the rule described by Hair et al. [76], the factor loadings, composite reliability, and average variance extracted were used to calculate convergent validity. When items load highly (i.e., >0.50) on their linked variables, then the measurement scale was considered to have convergent validity [76], and if no item loads more highly on another variable than its actual variable for which it aims to estimate [77,78]. After calculating confirmatory factor analysis (CFA) while using PLS PCA (Figure 2), out of a total of 52 items from the seven constructs of this study, a total of 50 items were retained for further analysis after erasing two items (ES8 and LDSE4) due to their low cross-loading values, deleting items of latent variables with low loading raised the total variance explained. As shown in Table 2, all the items were loaded more highly only on their particular variables than on any other variables. AVE for a variable must bigger than the variance shared between the variable and other variables in a research model [79]. As a convention, an AVE value of 0.50 or greater is assumed satisfactory. This threshold holds valid in this study, as well.

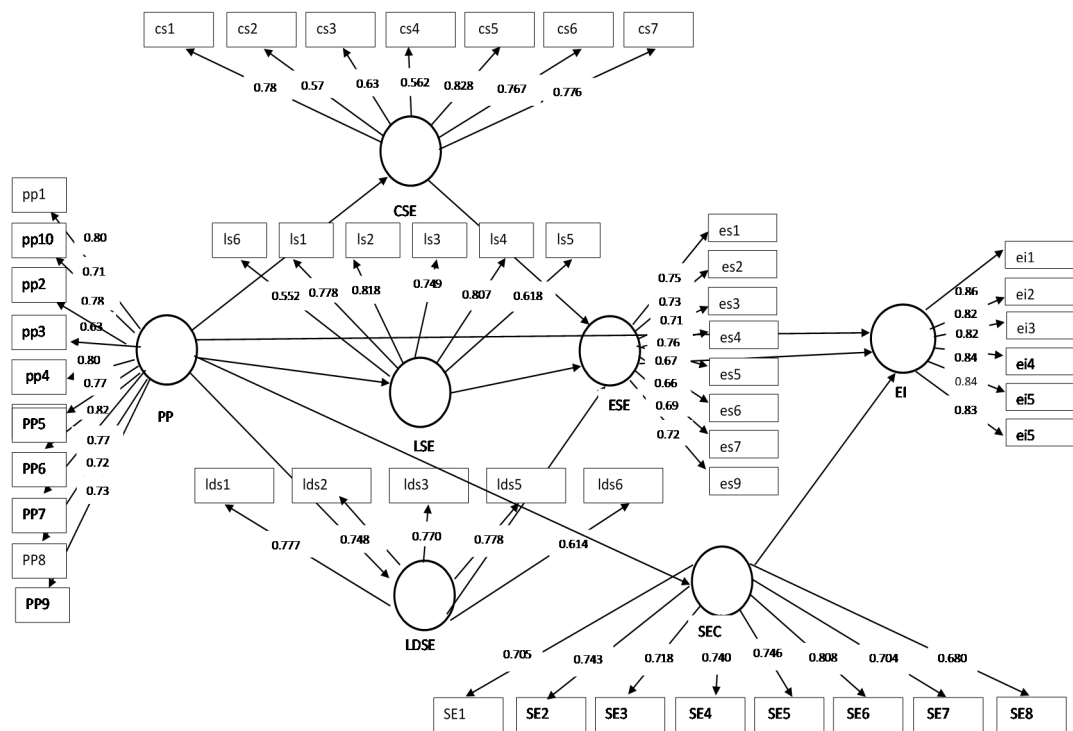


Figure 2. Confirmatory factor analysis.

Table 2. Confirmatory Factor Analysis.

Construct	Items	Loadings	Alpha	CR	AVE
Creative self-efficacy	cs1	0.789	0.833	0.876	0.507
	cs2	0.573			
	cs3	0.636			
	cs4	0.562			
	cs5	0.828			
	cs6	0.767			
	cs7	0.776			
Entrepreneurial Intentions	ei1	0.863	0.971	0.935	0.706
	ei2	0.825			
	ei3	0.825			
	ei4	0.846			
	ei5	0.844			
	ei6	0.837			
Entrepreneurial self-efficacy	es1	0.751	0.864	0.893	0.512
	es2	0.737			
	es3	0.719			
	es4	0.763			
	es5	0.67			
	es6	0.662			
	es7	0.693			
	es9	0.724			
Leadership self-efficacy	lds1	0.777	0.791	0.857	0.547
	lds2	0.748			
	lds3	0.77			
	lds5	0.778			
	lds6	0.614			

**Table 2.** *Cont.*

Construct	Items	Loadings	Alpha	CR	AVE
Learning Self-efficacy	ls1	0.778	0.819	0.869	0.529
	ls2	0.818			
	ls3	0.749			
	ls4	0.807			
	ls5	0.618			
	ls6	0.552			
Proactive Personality	pp1	0.8	0.917	0.931	0.575
	pp10	0.714			
	pp2	0.784			
	pp3	0.633			
	pp4	0.807			
	pp5	0.779			
	pp6	0.82			
	pp7	0.771			
	pp8	0.722			
pp9	0.735				
Self-efficacy	SE1	0.705	0.876	0.902	0.535
	SE2	0.743			
	SE3	0.718			
	SE4	0.74			
	SE5	0.746			
	SE6	0.808			
	SE7	0.704			
	SE8	0.68			

Table 2 provided findings of the AVE with the extracted coefficients that ranged from 0.507 to 0.575, signifying that convergent validity was confirmed for all the understudied variables.

#### 4.1.1. Discriminant Validity

Discriminant validity signifies the extent to which a latent construct is predominantly dissimilar from other latent constructs (Hair et al., 2010). Two salient methods such as the Fornell–Larcker criterion (FLC) [80] and the Heterotrait-Monotrait Ratio (HTMT) [81] were utilized in the current study to assess discriminant validity.

#### 4.1.2. The Fornell–Larcker Criterion

To check the discriminant validity, the FLC criterion was deployed. To do this measurement, the square root of the AVE for all the studied variables was taken and contrasted with the correlation values of other studied variables [80].

Demonstration of the correlation matrix with the diagonal was made after calculating the square roots of AVE coefficients. The square value of AVE must be greater than the squared correlation value to establish discriminant validity [82]. In other words, to create satisfactory discriminant validity, the diagonal elements or coefficients must be bigger than the off-diagonal elements or coefficients in the respective columns and rows. Table 3 shows the outcomes of the discriminant validity evaluation of the understudied variables, all the square roots of AVE for the constructs are bigger than the off-diagonal elements or coefficients in the relative columns and rows, hence, confirming an indication of discriminant validity.

**Table 3.** Discriminant Validity.

	CSE	EI	ESE	LDSE	LSE	PP	SEC
CSE	0.712						
EI	0.582	0.84					
ESE	0.627	0.764	0.689				
LDSE	0.671	0.479	0.633	0.677			
LSE	0.273	0.232	0.32	0.318	0.722		
PP	0.561	0.465	0.528	0.643	0.301	0.634	
SEC	0.005	0.097	0.076	0.027	0.246	0.084	0.545

#### 4.1.3. The Heterotrait-Monotrait Ratio

Though, the Fornell–Larcker criterion has been widely used and considered one of the powerful methods to assess discriminant validity. Nevertheless, the said criterion (FLC) lacks the ability to accurately measure the discriminant validity in multiple research contexts. Therefore, the HTMT ratio was also used to assess the discriminant validity of constructs as proposed in a recent study [81]. Table 3 exhibits the outcomes of the discriminant validity evaluation, which adheres to the prescribed criterion that all the values should be less than 0.90 [83]; hence, discriminant validity was ensured for all studied variables in the context of private university students.

### 4.2. Structural Model

#### 4.2.1. Main/Direct Effects—PLS-SEM Structural Model

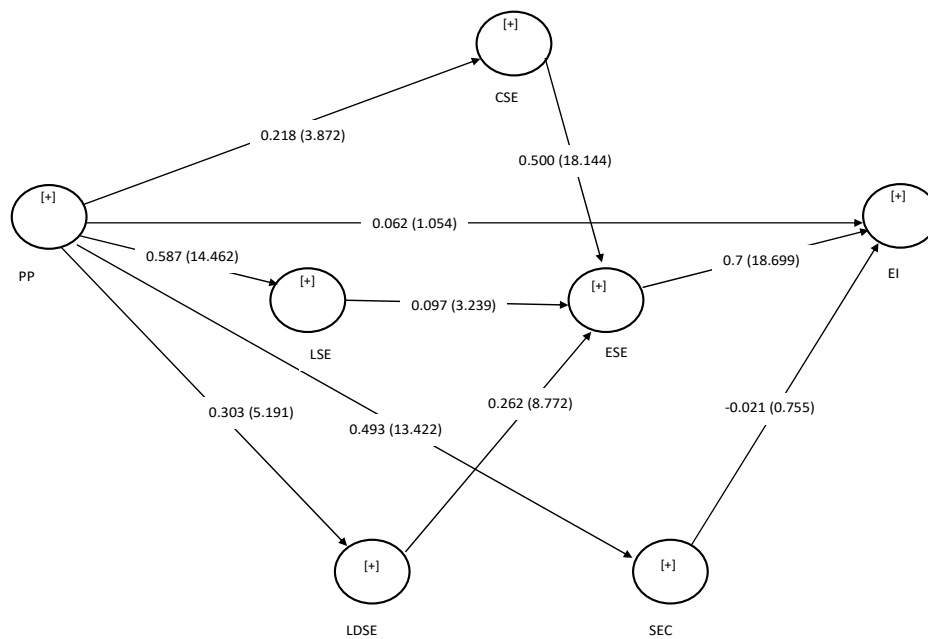
Partial least squares-structural equation modeling is a significant technique intended at capitalizing on the elucidated variance of the dependent variable. The beta values signify the strength of the power of each independent variable in the PLS structural model (Henseler, Ringle, and Sarstedt 2015). Hypothesis 1 predicted an effect of PP on the EI of university students. Results (Table 4, Figure 3) revealed an insignificant effect of PP on EI ( $\beta = 0.062, t = 1.054$ ), thus not supporting Hypothesis 1. Hypothesis 2 predicted the effect of PP on the CSE of university students. Results indicated a significant and positive effect of PP on the CSE ( $\beta = 0.218, t = 3.872$ ), thus supporting Hypothesis 2. Similarly, Hypothesis 3 predicted an effect of CSE on the ESE of university students. Findings determined a significant and positive impact of CSE on ESE ( $\beta = 0.5, t = 18.144$ ), again supports Hypothesis 3. Hypothesis 5 predicted the effect of PP on the LSE of university students. Results indicated a significant and positive effect of PP on the LSE ( $\beta = 0.587, t = 14.462$ ), thus supporting Hypothesis 5. Similarly, Hypothesis 6 predicted an effect of LSE on the ESE of university students. Results signify a positive impact of LSE on ESE ( $\beta = 0.097, t = 3.239$ ), which again supports Hypothesis 6. Hypothesis 8 predicted the impact of PP on the LDSE of university students. Results indicated a significant and positive effect of PP on the LSDE ( $\beta = 0.303, t = 5.191$ ), thus supporting Hypothesis 8. Hypothesis 9 predicted an effect of LDSE on ESE ( $\beta = 0.262, t = 8.772$ ), thus supporting Hypothesis 9. Hypothesis 11 predicted an effect of ESE on the EI of university students. Results indicated a significant and positive impact of ESE on EI ( $\beta = 0.7, t = 18.699$ ), thus supporting Hypothesis 11. Hypothesis 13a predicted an impact of PP on SEC ( $\beta = 0.493, t = 13.442$ ), thus supporting Hypothesis 13a. Hypothesis 13b projected an effect of SEC on the EI of university students. Findings indicated an insignificant effect of PP on the CSE ( $\beta = -0.021, t = 0.755$ ), thus not supporting Hypothesis 13b.



**Table 4.** Results of Main Effects Hypotheses.

Hypothesis	Relationships	Std. Beta	Std. Error	t-Value	LL	UL	Decision	Q <sup>2</sup> (= 1-SSE/SSO)	R <sup>2</sup>
H1	PP -> EI	0.062	0.058	1.054	-0.055	0.139	Not Supported	0.38	0.588
H2	PP -> CSE	0.218	0.056	3.872 **	0.121	0.31	Supported	0.022	0.048
H3	CSE -> ESE	0.5	0.028	18.144 **	0.458	0.547	Supported		
H5	PP -> LSE	0.587	0.041	14.462 **	0.517	0.651	Supported	0.167	0.345
H6	LSE -> ESE	0.097	0.03	3.239 **	0.047	0.148	Supported		
H8	PP -> LDSE	0.303	0.058	5.191 **	0.204	0.394	Supported	0.045	0.092
H9	LDSE -> ESE	0.262	0.03	8.772 **	0.211	0.31	Supported		
H11	ESE -> EI	0.7	0.037	18.699 **	0.632	0.756	Supported	0.256	0.544
H13a	PP -> SEC	0.493	0.037	13.442 **	0.435	0.553	Supported	0.116	0.243
H13b	SEC -> EI	-0.021	0.028	0.755	-0.066	0.025	Not Supported		

\*\* p ≤ 0.01.



**Figure 3.** Structural Path modeling (p- and t-values).

Estimation of the structural model in PLS-SEM can be done through one more substantial criterion which is the value of R squared. It is also labeled under the coefficient of determination [73,76,79]. Value of R-squared denotes the amount of variation in the endogenous constructs that can be elucidated by one or more exogenous constructs [79]. Although the satisfactory level of value is based on the research context, researchers have anticipated an R-squared value of 0.10 as a minimum suitable value [76]. Whereas, Chin [77] proposed that, in PLS-SEM, the R-squared values of 0.67 as substantial, 0.33 as moderate, and 0.19 as weak.

As indicated in Table 4, the research model explained 4.8%, 58.8%, 54.5%, 9.2%, 34.5%, and 24.3% of the variance in EI by CSE, EI, ESE, LDSE, LSE, and SEC, respectively. R square ranges from 0 to 1 and values nearer to 1 indicate a greater level of prediction precision. Hence, following Chin’s criteria [77], the dependent construct showed an acceptable level of R-squared value, which is considered as moderate except, LDSE, and CSE.

A cross-validated redundancy measure (Q<sup>2</sup>) was used to evaluate the predictive relevance of the research model as prescribed by previous studies [84–87]. The Q<sup>2</sup> is a measure to assess how fit a model predicts the data of removed cases [84,85]. As per criterion, a research model with Q<sup>2</sup> statistics greater than zero is assumed to be predictive relevant and higher positive Q<sup>2</sup> values delineate more predictive relevance [81]. As shown in Table 4, the cross-validation redundancy measure Q<sup>2</sup> for dependent latent construct is greater than zero, thus providing evidence for predictive relevance of the model.

#### 4.2.2. Mediation Analysis

More recent mediation models have exposed that the influence of the exogenous construct on the endogenous construct can be insignificant, yet significant mediation may still be found [87]. Inconsistent with this notion, mediation can exist in case if the independent variable has an insignificant relationship with the dependent variable (PP on EI) [88]. Therefore, mediation analysis was carried out.

The bootstrapping analysis showed in Table 5 that all the three indirect effects  $\beta = 0.109$ ,  $\beta = 0.057$ , and  $\beta = 0.079$  were significant with the *t*-values of 3.741, 3.172, and 4.225, respectively. As specified by Preacher and Hayes [89] the indirect effects 95% Boot CI as shown in Table 5: [LL = 0.061, UL = 0.157], [LL = 0.027, UL = 0.087], and [LL = 0.049, UL = 0.112] did not include zero within range demonstrating that mediation exist. Thus, the mediation influence is significant statistically, representing that H4, H7, and H10 were given support. Thus, parallel mediation of CSE, LSE, LDSE exists in the relationship between PP and ESE. Whereas, results revealed an insignificant indirect effect of PP on EI ( $\beta = -0.01$ ,  $t = 0.749$ ), thus not supporting Hypothesis 13c and mediation of SEC between the relationship of PP on EI was not confirmed.

**Table 5.** Mediation Results.

	Relationships	Std. Beta	Std. Error	t-Value	LL	UL	Decision
H4	PP -> CSE -> ESE	0.109	0.029	3.741 **	0.061	0.157	Supported
H7	PP -> LSE -> ESE	0.057	0.018	3.172 **	0.027	0.087	Supported
H10	PP -> LDSE -> ESE	0.079	0.019	4.225 **	0.049	0.112	Supported
H13c	PP -> SEC -> EI	-0.01	0.014	0.749	-0.032	0.013	Not supported

\*\*  $p \leq 0.01$ .

#### 4.2.3. Serial Mediation

The specific indirect path showed, as depicted in Table 6, that CSE and ESE were two mediators in serial form between the relationship of PP-EI. This study found evidence for serial mediation of CSE and ESE in an indirect effect of PP on EI ( $\beta = 0.076$ ,  $t = 3.68$ ), thus supporting Hypothesis 12a. Findings postulated that in parallel to CSE, LSE was also a mediator along with ESE in serial form between the relationship of PP-EI because no zero-value straddled between the lower level and upper level. This study found evidence for serial mediation of LSE and ESE in an indirect effect of PP on EI ( $\beta = 0.04$ ,  $t = 3.191$ ), thus supporting Hypothesis 12b. The study findings were evident for serial mediation of LDSE and ESE in an indirect effect of PP on EI ( $\beta = 0.056$ ,  $t = 3.978$ ), thus supporting Hypothesis 12c. Thus, the study inferred that serial mediation of CSE, LSE, LDSE with ESE exists in the relationship between PP-EI.

**Table 6.** Serial Mediation Results.

Hypothesis	Relationships	Std. Beta	Std. Error	t Value	LL	UL	Decision
H12a	PP -> CSE -> ESE -> EI	0.076	0.021	3.68 **	0.042	0.111	Supported
H12b	PP -> LSE -> ESE -> EI	0.04	0.013	3.191 **	0.019	0.061	Supported
H12c	PP -> LDSE -> ESE -> EI	0.056	0.014	3.978 **	0.033	0.08	Supported

\*\*  $p \leq 0.01$ .

### 5. Discussion

Findings demonstrated that PP is not significantly related to the EI of the university students of the sample taken in the paper. This result is not in alignment with previous studies [15,16]. This finding gives the notion that PP alone cannot influence one’s EI and indicate that Pakistani university students may not realize the importance of being proactive for becoming future entrepreneurs. The direct

insignificant relationship also determines to a large extent that independent variables may affect dependent variables through other variables in the case of Pakistani university students.

Since mediation can exist in case if an independent variable has an insignificant relationship with the dependent variable [89]. Thus, further hypotheses are measured to find a mechanism through which a PP can influence the EI of university students. This study narrated the fundamentals of the cognitive system by comprising both narrow personality type (PP) and broad forms of self-efficacy (CSE and LSE) in an intention-based theory of entrepreneurship. The extant examination found a significant positive effect of PP on the CSE. Which infers proactive people are confident in their ability for creativity. This result is supported by earlier research performed in the entrepreneurship domain [21]. Next, CSE significantly and positively influences the ESE of university students which is consistent with previous studies [25].

Findings indicated a significant positive effect of PP on the LSE and a substantial positive impact of LSE on ESE, thus in alignment with others' views [34,37]. Accounting for the complete array of entrepreneurial activities included in initiating and doing a new business, thereby, it would not be astonishing that the results showed that ESE alone is not sufficient to entirely appreciate the perceptions of feasibility.

It is considered that a student's belief in his ability to learn, lead, and perform tasks creatively are important factors in shaping the perceived feasibility of enterprise development. Additionally, results indicate a significant positive effect of PP on the LSDE and LDSE further significantly affects ESE as supported in former studies [15,21]. Proactive individuals are driven by the desire to lead others in order to become successful entrepreneurs.

Additionally, there is a significant positive relationship between ESE and EI. This result is widely accepted that those who have intentions to become entrepreneurs actually are confident in their abilities to establish new businesses [49]. The view is also supported that PP has an influence on the SEC, indicating proactive students demonstrate inner confidence. This result is similar to earlier studies performed in the entrepreneurship domain [21,42]. Results indicated that there is an insignificant relationship between SEC and EI; thus, it does not find support for this hypothesis, which is not aligned with some researchers [50]. This led us to assume that an individual's perception of having a general kind of self-efficacy may not lead to the desire to start a venture; rather broader forms such as LDSE, CSE, LSE, and ESE are adequate in predicting one's EI.

This research further investigated serial mediation (between PP and EI) and parallel mediation (between PP and ESE). CSE mediates between the PP and ESE relationship which is consistent with a recent study [13]. The findings support the notion that proactive individuals can achieve entrepreneurial activities through creativity [33,90]. This delineates us to adopt deliberate interventions for open innovation, for instance, the culture for open innovation dynamics within institutes should be developed [7] which will, in turn, augment the innovative and creative skills of potential entrepreneurs. Precisely, the results disclose that those individuals who are more proactive are likely to have higher ESE due to LSE, which is consistent with the recent study [13].

In a similar vein, proactive people also have advanced levels of LDSE which produces EI. Thus, the present research emphasizes the inclusion of PP with broad forms of self-efficacy while investigating the fundamentals of the self-efficacy of university students. Thus, it is established that CSE, LSE, and LDSE are parallel mediators between PP and ESE. However, general self-efficacy does not mediate the relationship between PP and EI. Consequently, proclaiming the significance of preferring broad forms of self-efficacy over general self-efficacy.

LSE, LDSE, and ESE are two serial mediators in the relationship between PP and EI. Explicitly, the results infer that individuals with proactive and competitive personalities are more inclined to have a higher level of ESE due to their ability to learn, lead, and their ingenuity. Proactive individuals tend to demonstrate creativity, leadership, and passion for learning and thereby have more chances to have entrepreneurial confidence in their future endeavors. It is highly significant that platforms of innovation are provided that reinforce the dynamics of new industrial knowledge and make students

aware of the current industrial practices. Deep insight into industrial knowledge and practices will guarantee successful venture creation. This will enable students to master the dynamics of innovation as well. Since organizations are facing rigorous competition and have entered into the digital era of technology, potential entrepreneurs have sufficient opportunities to seize in the realm of technological change [7].

### 5.1. Conclusions

On the whole, the present research encompasses understanding the pathways and intervening variables through which students' PP can influence their EI. The existing research enlarges the phenomenon of entrepreneurial feasibility by exhibiting that various recent forms of self-efficacy beliefs (such as leadership self-efficacy) that underscore the relationship between ESE and PP. Though there have been many studies examining the predecessors of university students' EI, the extant study covers the theoretical gap by integrating specific self-efficacy and broader forms of self-efficacy as highly significant parallel and serial mediators between PP and EI relationship. Underlying on assertions of TPB and SCT, the current research model unfolds the complex mechanism of individuals' personalities and establishing new venture intentions. The results of the study open avenues for future studies in this arena.

#### 5.1.1. Theoretical Contribution

This paper made several significant theoretical contributions. Firstly, this study extends to the existing literature available on PP and EI by showing the interplay of mediating variables between this relationship, unlike other studies that investigate only the direct relationship between the PP of students and EI. Secondly, this study seeks to expand our understanding of entrepreneurial feasibility using social cognitive theory which proposes that narrow specific self-efficacy beliefs, for example, entrepreneurial self-efficacy are produced from broader, less specific self-efficacy beliefs. In this study, the idea of entrepreneurial feasibility was extended by underscoring three broader self-efficacies (learning self-efficacy, creative self-efficacy, leadership self-efficacy) on the basis of a generative view of self-efficacy. Thirdly, the extant research provided empirical evidence to the theory of planned behavior and social cognitive theory in the context of university students. It further offers solid theoretical foundations using a psychological perspective to one's EI.

#### 5.1.2. Practical Implications

The implications of the study are two-fold. (1) The study implies valuable suggestions from a practical point of view and delineates novel avenues for promoting nascent entrepreneurial careers. Universities may include entrepreneurial activities to develop an entrepreneurial mindset and entrepreneurship orientation in students through (i) Placing a business incubation center that can help students start up their own business or scale up their existing family business. To scale up their family business, students can be guided to bring open innovation by transforming extant venture models into creative business models grounding on their own thinking experiments. (ii) Experiential learning-based projects that require operational research and practical fieldwork such as projects on business proposals, corporate consultancy, community development, social entrepreneurship, and entrepreneurial exposition. (iii) Develop a competency-based framework that promotes self-efficacy levels to enhance creativity, learning, and leadership confidence, thereby increasing initiative ability in students [21,90,91]. The study advocates to emphasize developing awareness on open innovation, which relies heavily on a blend of both technologies and markets and is considered an integral ingredient of a sustainable business model and innovation dynamics [92]. Such courses should be taught that discuss entrepreneurial cyclical dynamics of open innovation to facilitate students in bringing innovative performance in their future business [93]. The universities should focus their attention on altering personal attributes and skills rather than only transmitting knowledge. Entrepreneurial culture can be imparted through co-curricular (diligent participation in seminars, student academic and

social clubs/societies) and extra-curricular activities (gaming, outdoor activities, event management). (2) The theoretical implications are related to conceptual enhancement and development in the field of entrepreneurship self-efficacy and personality traits. The current study outspreads knowledge in the arena of open innovation and provides deep insight into the entrepreneurship field.

### 5.1.3. Limitations and Future Directions

This study has a few limitations just like others namely, first, the current model does not include social, external, and environmental factors. Second, the research only relies on quantitative analysis so qualitative methods can be utilized to predict the instruments of EI. Third, the study views EI as a cognitive process, which does not supersede the behavioral paradigm. Fourth, the study is associated with the generalizability of results from the sample of university students taken in a single province of one country only. So, the same understudied model can be applied to other nationalities, as these university students epitomize an imperative part of the likely future entrepreneurs and their participation in this data empowers us to appreciate the entrepreneurial process.

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## References

1. Lee, R.; Park, J.G.; Park, S.H. Effects of system management on value creation and global growth in born startups: Focusing on born startups in Korea. *J. Open Innov. Technol. Mark. Complex.* **2020**, *6*, 19. [CrossRef]
2. Barba-Sánchez, V.; Atienza-Sahuquillo, C. Entrepreneurial intention among engineering students: The role of entrepreneurship education. *Eur. Res. Manag. Bus. Econ.* **2018**, *24*, 53–61. [CrossRef]
3. Entrialgo, M.; Iglesias, V. The moderating role of entrepreneurship education on the antecedents of entrepreneurial intention. *Int. Entrep. Manag. J.* **2016**, *12*, 1209–1232. [CrossRef]
4. Nabi, G.; Walmsley, A.; Liñán, F.; Akhtar, I.; Neame, C. Does entrepreneurship education in the first year of higher education develop entrepreneurial intentions? The role of learning and inspiration. *Stud. High. Educ.* **2018**, *43*, 452–467. [CrossRef]
5. Peterman, N.E.; Kennedy, J. Enterprise education: Influencing students' perceptions of entrepreneurship. *Entrep. theory Pract.* **2003**, *28*, 129–144. [CrossRef]
6. Franke, N.; Lüthje, C. Entrepreneurial intentions of business students—A benchmarking study. *Int. J. Innov. Technol. Manag.* **2004**, *1*, 269–288. [CrossRef]
7. Yun, J.J.; Park, K.; Hahm, S.D.; Kim, D. Basic Income with High Open Innovation Dynamics: The Way to the Entrepreneurial State. *J. Open Innov. Technol. Mark. Complex.* **2019**, *5*, 41. [CrossRef]
8. Pakistan Bureau of Statistics Population Census. Government of Pakistan. Change. Available online: [http://www.pbs.gov.pk/sites/default/files/EOI\\_INSTRUCTIONS.pdf](http://www.pbs.gov.pk/sites/default/files/EOI_INSTRUCTIONS.pdf) (accessed on 24 November 2020).
9. Saboor, A.; Sadiq, S.; Khan, A.U.; Hameed, G. Dynamic Reflections of Crimes, Quasi Democracy and Misery Index in Pakistan. *Soc. Indic. Res.* **2016**, *133*, 31–45. [CrossRef]
10. Kamran, A.; Shujaat, S.; Syed, N.A.; Ali, S.N. A Study on Determinants of Unemployment in Pakistan. In *Proceedings of the Seventh International Conference on Management Science and Engineering Management*; Springer: Berlin/Heidelberg, Germany, 2013; Volume 242, pp. 1337–1348.
11. Shepherd, D.A.; Patzelt, H.; Baron, R.A. "I care about nature, but . . ." disengaging values in assessing opportunities that cause harm. *Acad. Manag. J.* **2013**, *56*, 1251–1273. [CrossRef]
12. Zhao, H.; Seibert, S.E.; Hills, G.E. The mediating role of self-efficacy in the development of entrepreneurial intentions. *J. Appl. Psychol.* **2005**, *90*, 1265. [CrossRef]



13. Fuller, B.; Liu, Y.; Bajaba, S.; Marler, L.E.; Pratt, J. Examining how the personality, self-efficacy, and anticipatory cognitions of potential entrepreneurs shape their entrepreneurial intentions. *Pers. Individ. Differ.* **2018**, *125*, 120–125. [[CrossRef](#)]
14. Rauch, A.; Frese, M. Let's put the person back into entrepreneurship research: A meta-analysis on the relationship between business owners' personality traits, business creation, and success. *Eur. J. Work Organ. Psychol.* **2007**, *16*, 353–385. [[CrossRef](#)]
15. Parker, S.K.; Bindl, U.K. *Proactivity at Work: Making Things Happen in Organizations*; Taylor & Francis: Abingdon, UK, 2016; ISBN 9781317752578.
16. Li, W.D.; Fay, D.; Frese, M.; Harms, P.D.; Gao, X.Y. Reciprocal relationship between proactive personality and work characteristics: A latent change score approach. *J. Appl. Psychol.* **2014**, *99*, 948–965. [[CrossRef](#)] [[PubMed](#)]
17. Travis, J.; Freeman, E. Predicting entrepreneurial intentions: Incremental validity of proactive personality and entrepreneurial Self-Efficacy as a moderator. *J. Entrep. Educ.* **2017**, *20*, 1–13.
18. Amabile In Pursuit of Everyday Creativity. *J. Creat. Behav.* **2017**, *51*, 335–337. [[CrossRef](#)]
19. Horng, J.S.; Tsai, C.Y.; Yang, T.C.; Liu, C.H.; Hu, D.C. Exploring the relationship between proactive personality, work environment and employee creativity among tourism and hospitality employees. *Int. J. Hosp. Manag.* **2016**, *54*, 25–34. [[CrossRef](#)]
20. Wang, Z.; Zhang, J.; Thomas, C.L.; Yu, J.; Spitzmueller, C. Explaining benefits of employee proactive personality: The role of engagement, team proactivity composition and perceived organizational support. *J. Vocat. Behav.* **2017**, *101*, 90–103. [[CrossRef](#)]
21. Li, M.; Liu, Y.; Liu, L.; Wang, Z. Proactive Personality and Innovative Work Behavior: The Mediating Effects of Affective States and Creative Self-Efficacy in Teachers. *Curr. Psychol.* **2016**, *36*, 697–706. [[CrossRef](#)]
22. Farmer, S.M.; Tierney, P. Considering Creative Self-Efficacy: Its Current State and Ideas for Future Inquiry. *Creat. Self* **2017**, 23–47. [[CrossRef](#)]
23. Li, C.; Naz, S.; Dodor, A.; Ashraf, S.F.; Akolgo, I.G. An investigation of the relationship between proactive personality and entrepreneurial intentions using PLS-SEM among potential entrepreneurs in Pakistan. *WALIA J.* **2018**, *34*, 120–131.
24. Mohammadzadeh, M.; Awang, H.; Kadir Shahar, H.; Ismail, S. Life Skills Education for Malaysian Institutionalised Adolescents: Knowledge, Needs and Priorities: A Qualitative Pilot Study. *Iran. J. Public Health* **2017**, *46*, 1739–1741. [[PubMed](#)]
25. McMullan, W.E.; Kenworthy, T.P. Modernizing Schumpeter: Toward a New General Theory of Entrepreneurship. In *Creativity and Entrepreneurial Performance*; Springer International Publishing: Cham, Switzerland, 2015; pp. 57–72.
26. Gielnik, M.M.; Frese, M.; Graf, J.M.; Kampschulte, A. Creativity in the opportunity identification process and the moderating effect of diversity of information. *J. Bus. Ventur.* **2012**, *27*, 559–576. [[CrossRef](#)]
27. Schachter, M.; García-Granero, A.; Sánchez-Barrioluengo, M.; Quesada-Pineda, H.; Amara, N. Disentangling competences: Interrelationships on creativity, innovation and entrepreneurship. *Think. Ski. Creat.* **2015**, *16*, 27–39. [[CrossRef](#)]
28. Liu, F.; Chow, I.H.S.; Gong, Y.; Wang, H. Mediating links between HRM bundle and individual innovative behavior. *J. Manag. Organ.* **2019**, *25*, 157–172. [[CrossRef](#)]
29. Sawyer, R.K. *Explaining Creativity: The Science of Human Innovation*; Oxford University Press: Oxford, UK, 2006; Volume 27, ISBN 0195304454.
30. Ahlin, B.; Drnovšek, M.; Hisrich, R.D. Entrepreneurs' creativity and firm innovation: The moderating role of entrepreneurial self-efficacy. *Small Bus. Econ.* **2014**, *43*, 101–117. [[CrossRef](#)]
31. Newman, A.; Obschonka, M.; Schwarz, S.; Cohen, M.; Nielsen, I. Entrepreneurial self-efficacy: A systematic review of the literature on its theoretical foundations, measurement, antecedents, and outcomes, and an agenda for future research. *J. Vocat. Behav.* **2019**, *110*, 403–419. [[CrossRef](#)]
32. Liao, H.; Raub, S.P.; Hong, Y.; Han, J.H. What it Takes to Get Proactive: An Integrative Model of the Antecedents of Personal Initiative. *Acad. Manag. Proc.* **2015**, *2014*, 13140. [[CrossRef](#)]
33. Lin, S.-H.; Lu, W.C.; Chen, M.-Y.; Chen, L.H. Association between proactive personality and academic self-efficacy. *Curr. Psychol.* **2014**, *33*, 600–609. [[CrossRef](#)]
34. Huang, L.; Luthans, F. Toward Better Understanding of the Learning Goal Orientation-Creativity Relationship: The Role of Positive Psychological Capital. *Appl. Psychol.* **2015**, *64*, 444–472. [[CrossRef](#)]

35. Lafontaine, F.G.; Léger, P.M.; Labonté-Lemoyne, É.; Charland, P.; Cronan, P. Combining vicarious and enactive training in IS: Does order matter? *Inf. Syst. Neurosci.* **2017**, *16*, 99–106.
36. Govaerts, N. *Multidimensional Role of The Supervisor Transfer of Training in Corporate Settings Toward an Understanding of The Multidimensional*; KU LEUVEN: Leuven, Belgium, 2017.
37. Major, D.A.; Turner, J.E.; Fletcher, T.D. Linking Proactive Personality and the Big Five to Motivation to Learn and Linking Proactive Personality and the Big Five to Motivation to Learn and Development Activity. *J. Appl. Psychol.* **2014**, *91*, 927. [[CrossRef](#)] [[PubMed](#)]
38. Antonacopoulou, E.P. Employee development through self-development in three retail banks. *Pers. Rev.* **2000**, *29*, 491–508. [[CrossRef](#)]
39. Wang, J.H.; Chang, C.-C.; Yao, S.-N.; Liang, C. The contribution of self-efficacy to the relationship between personality traits and entrepreneurial intention. *High. Educ.* **2016**, *72*, 209–224. [[CrossRef](#)]
40. Krueger, N.; Reilly, M.D.; Carsrud, A.L. Competing models of entrepreneurial intentions. *J. Bus. Ventur.* **2000**, *15*, 411–432. [[CrossRef](#)]
41. Hagen, A.; Tootoonchi, A.; Hassan, M. Integrating entrepreneurship and strategic management activities to gain wealth: CEOs' perspectives. *Adv. Compet. Res.* **2005**, *13*, 48.
42. Seibert, S.E.; Sargent, L.D.; Kraimer, M.L.; Kiazad, K. Linking Developmental Experiences to Leader Effectiveness and Promotability: The Mediating Role of Leadership Self-Efficacy and Mentor Network. *Pers. Psychol.* **2017**, *70*, 357–397. [[CrossRef](#)]
43. Crossley, C.D.; Cooper, C.D.; Wernsing, T.S. Making things happen through challenging goals: Leader Proactivity, Trust, and Business-Unit Performance. *J. Appl. Psychol.* **2013**, *98*, 540–549. [[CrossRef](#)]
44. Gupta, V.; MacMillan, I.C.; Surie, G. Entrepreneurial leadership: Developing and measuring a cross-cultural construct. *J. Bus. Ventur.* **2004**, *19*, 241–260. [[CrossRef](#)]
45. Shane, S.; Venkataraman, S. The Promise of Entrepreneurship as a Field of Research. *Acad. Manag. Rev.* **2000**, *25*, 217–226. [[CrossRef](#)]
46. Shook, C.L.; Priem, R.L.; McGee, J.E. Venture creation and the enterprising individual: A review and synthesis. *J. Manag.* **2003**, *29*, 379–399.
47. Darling, J.R.; Keeffe, M.J.; Ross, J.K. Entrepreneurial Leadership Strategies and Values: Keys to Operational Excellence. *J. Small Bus. Entrep.* **2007**, *20*, 41–54. [[CrossRef](#)]
48. Esfandiari, K.; Sharifi-Tehrani, M.; Pratt, S.; Altinay, L. Understanding entrepreneurial intentions: A developed integrated structural model approach. *J. Bus. Res.* **2019**, *94*, 172–182. [[CrossRef](#)]
49. Keane, S. Entrepreneurial self-efficacy (ESE): A business model approach. *Education* **2016**, *11*, 9.
50. Cardon, M.S.; Kirk, C.P. Entrepreneurial Passion as Mediator of the Self-Efficacy to Persistence Relationship. *Entrep. Theory Pract.* **2015**, *39*, 1027–1050. [[CrossRef](#)]
51. Brinckmann, J.; Kim, S.M. Why We Plan: The Impact of Nascent Entrepreneurs' Cognitive Characteristics and Human Capital on Business Planning. *Strateg. Entrep. J.* **2015**, *9*, 153–166. [[CrossRef](#)]
52. Trevelyan, R. Self-regulation and effort in entrepreneurial tasks. *Int. J. Entrep. Behav. Res.* **2011**, *17*, 39–63. [[CrossRef](#)]
53. Hsieh, H.; Huang, J. The Effects of Socioeconomic Status and Proactive Personality on Career Decision Self-Efficacy. *Career Dev. Q.* **2014**, *62*, 29–43. [[CrossRef](#)]
54. Bandura, A. The role of self-efficacy in goal-based motivation. In *New Developments in Goal Setting and Task Performance*; Routledge/Taylor & Francis Group: Abingdon, UK, 2013; pp. 147–157.
55. Piperopoulos, P.; Dimov, D. Burst bubbles or build steam? Entrepreneurship education, entrepreneurial self-efficacy, and entrepreneurial intentions. *J. small Bus. Manag.* **2015**, *53*, 970–985. [[CrossRef](#)]
56. Carter, W.R.; Nesbit, P.L.; Badham, R.J.; Parker, S.K.; Sung, L.-K. The effects of employee engagement and self-efficacy on job performance: A longitudinal field study. *Int. J. Hum. Resour. Manag.* **2018**, *29*, 2483–2502. [[CrossRef](#)]
57. Bandura, A. On the Functional Properties of Perceived Self-Efficacy Revisited. Available online: <https://journals.sagepub.com/doi/full/10.1177/0149206311410606> (accessed on 24 November 2020).
58. Aguenza, B.B.; Som, A.P.M. Motivational Factors of Employee Retention and Engagement in Organizations. *IJAME* **2018**, *1*, 88–95.
59. Brandstätter, H. Personality aspects of entrepreneurship: A look at five meta-analyses. *Pers. Individ. Dif.* **2011**, *51*, 222–230. [[CrossRef](#)]

60. Prabhu, V.P.; McGuire, S.J.; Drost, E.A.; Kwong, K.K. Proactive personality and entrepreneurial intent. *Int. J. Entrep. Behav. Res.* **2012**, *18*, 559–586. [[CrossRef](#)]
61. Baena-Luna, P.; García-Río, E.; Monge-Agüero, M. Entrecomp: Competent framework for entrepreneurship. A systematic review of the literature on its use and application. *Inf. Technol.* **2020**, *31*, 163–172. [[CrossRef](#)]
62. Kumar, R.; Shukla, S. Creativity, Proactive Personality and Entrepreneurial Intentions: Examining the Mediating Role of Entrepreneurial Self-efficacy. *Glob. Bus. Rev.* **2019**. [[CrossRef](#)]
63. Miao, C.; Qian, S.; Ma, D. The Relationship between Entrepreneurial Self-Efficacy and Firm Performance: A Meta-Analysis of Main and Moderator Effects. *J. Small Bus. Manag.* **2017**, *55*, 87–107. [[CrossRef](#)]
64. Zhang, J.; Miao, D.; Sun, Y.; Xiao, R.; Ren, L.; Xiao, W.; Peng, J. The Impacts of Attributional Styles and Dispositional Optimism on Subject Well-Being: A Structural Equation Modelling Analysis. *Soc. Indic. Res.* **2014**, *119*, 757–769. [[CrossRef](#)]
65. Bandura, A. Human agency in social cognitive theory. *Am. Psychol.* **1989**, *44*, 1175–1184. [[CrossRef](#)]
66. Ajzen, I. The theory of planned behaviour: Reactions and reflections. *Psychol. Health* **2011**, *26*, 1113–1127. [[CrossRef](#)]
67. Ajzen, I. The theory of planned behavior. *Organ. Behav. Hum. Decis. Process.* **1991**, *50*, 179–211. [[CrossRef](#)]
68. Zaman, U.; Jabbar, Z.; Nawaz, S.; Project, M.A.-I.J. of; 2019, Understanding the soft side of software projects: An empirical study on the interactive effects of social skills and political skills on complexity–performance relationship. *Int. J. Proj. Manag.* **2019**, *37*, 444–460. [[CrossRef](#)]
69. Zaman, U. Examining the effect of xenophobia on “transnational” mega construction project (MCP) success: Moderating role of transformational leadership and high-performance work (HPW) practi Examining the effect of xenophobia on “transnational” mega construction project (MCP) success Moderating role of transformational leadership and high-performance work (HPW) practices. *Eng. Constr. Archit. Manag.* **2020**, *27*, 1119–1143.
70. Seibert, S.E.; Crant, J.M.; Kraimer, M.L. Proactive personality and career success. *J. Appl. Psychol.* **1999**, *84*, 416. [[CrossRef](#)] [[PubMed](#)]
71. Liñán, F.; Chen, Y. Development and Cross-Cultural application of a specific instrument to measure entrepreneurial intentions. *Entrep. theory Pract.* **2009**, *33*, 593–617. [[CrossRef](#)]
72. Abbott, D.H. Constructing a Creative Self-Efficacy Inventory: A Mixed Methods Inquiry. *Open Access Theses Diss. College Educ. Hum. Sci.* **2010**, *68*, 1–283.
73. Klobas, J.E.; Renzi, S.; Nigrelli, M.L. *A Scale for The Measurement of Self-Efficacy for Learning (SEL) at University*; Bocconi University, Carlo F. Dondeña Centre for Research on Social Dynamics: Milan, Italy, 2007.
74. Bobbio, A.; Manganelli, A.M. Leadership self-efficacy scale. A new multidimensional instrument. *Tpm-Test. Psychom. Methodol. Appl. Psychol.* **2009**, *16*, 3–24.
75. Chen, G.; Gully, S.M.; Eden, D. Validation of a new general self-efficacy scale. *Organ. Res. methods* **2001**, *4*, 62–83. [[CrossRef](#)]
76. Hair, J.F.; Anderson, R.E.; Tatham, R.L.; Black, W.C. *Multivariate Data Analysis: A Global Perspective*; Pearson: Upper Saddle River, NJ, USA, 2010.
77. Duckworth, A.L.; Kern, M.L. A meta-analysis of the convergent validity of self-control measures. *J. Res. Pers.* **2011**, *45*, 259–268. [[CrossRef](#)]
78. Zaman, U.; Nawaz, S.; Tariq, S.; Humayoun, A.A. Linking transformational leadership and “multi-dimensions” of project success: Moderating effects of project flexibility and project visibility using PLS-SEM. *Int. J. Manag. Proj. Bus.* **2019**, *13*, 103–127. [[CrossRef](#)]
79. Carter Using confirmatory factor analysis to manage discriminant validity issues in social pharmacy research. *Int. J. Clin. Pharm.* **2016**, *38*, 731–737.
80. Fornell, C.; Larcker, D.F. Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *J. Mark. Res.* **1981**, *18*, 39–50. [[CrossRef](#)]
81. Henseler, J.; Ringle, C.M.; Sarstedt, M. A new criterion for assessing discriminant validity in variance-based structural equation modeling. *J. Acad. Mark. Sci.* **2015**, *43*, 115–135. [[CrossRef](#)]
82. Hair, J.F.; Hult, G.T.M.; Ringle, C.; Sarstedt, M. *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*; Sage Publications: Thousand Oaks, CA, USA, 2016; ISBN 1483377466.
83. Chin, W.W.; Marcoulides, G.A. *Modern Methods for Business Research*; Psychology Press: New York, NY, USA, 1998; ISBN 978-0805830934.

84. Hair, J.F.; Ringle, C.M.; Sarstedt, M. Partial least squares structural equation modeling: Rigorous applications, better results and higher acceptance. *Long Range Plan.* **2013**, *46*, 1–12. [[CrossRef](#)]
85. Stone, M. Cross-Validatory Choice and Assessment of Statistical Predictions. *J. R. Stat. Soc. Ser. B* **1974**, *36*, 111–147. [[CrossRef](#)]
86. Chin, W.W. How to Write Up and Report PLS Analyses. In *Handbook of Partial Least Squares*; Springer: Berlin/Heidelberg, Germany, 2010; pp. 655–690, ISBN 978-3-540-32825-4/978-3-540-32827-8.
87. MacKinnon, D.P.; Krull, J.L.; Lockwood, C.M. Equivalence of the mediation, confounding and suppression effect. *Prev. Sci.* **2000**, *1*, 173–181. [[CrossRef](#)]
88. Hair, J.F., Jr.; Matthews, L.M.; Matthews, R.L.; Sarstedt, M. PLS-SEM or CB-SEM: Updated guidelines on which method to use. *Int. J. Multivar. Data Anal.* **2017**, *1*, 107. [[CrossRef](#)]
89. Preacher, K.J.; Hayes, A.F. Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behav. Res. Methods* **2008**, *40*, 879–891. [[CrossRef](#)]
90. Ashraf, S.F.; Li, C.; Butt, R.S.; Naz, S.; Zafar, Z. Education as Moderator: Integrative Effect towards Succession Planning Process of Small Family Businesses. *Pac. Bus. Rev. Int.* **2019**, *11*, 107–123.
91. Li, C.; Ahmed, N.; Khan, S.A.; Naz, S. Role of Business Incubators as a Tool for Entrepreneurship Development: The Mediating and Moderating Role of Business Start-up and Government Regulations. *Sustainability* **2020**, *12*, 1822. [[CrossRef](#)]
92. Yun, J.H.J.; Zhao, X.; Jung, K.H.; Yigitcanlar, T. The culture for open innovation dynamics. *Sustainability* **2020**, *12*, 5076. [[CrossRef](#)]
93. Yun, J.J.; Zhao, X. Business Model Innovation through a Rectangular Compass: From the Perspective of Open Innovation with Mechanism Design. *J. Open Innov. Technol. Mark. Complex.* **2020**, *6*, 131. [[CrossRef](#)]

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