

# How Can Entrepreneurial Self-Efficacy, Proactivity and Creativity Enhance Sustainable Recognition Opportunity? The Effect of Entrepreneurial Alertness Is to Mediate the Formation of Sustainable Entrepreneurial Intention

Nosheena Yasir<sup>a\*</sup>, Nasir Mahmood<sup>b</sup>, Ali Aziz Jutt<sup>c</sup>, Muhammad Babar<sup>d</sup>, Muhammad Irfan<sup>e</sup>, Farhan Jamil<sup>f</sup>, Muhammad Zeeshan Shaukat<sup>g</sup>, Hafiz Mustafa Khan<sup>h</sup>, An Liren<sup>i\*</sup>

## Abstract

Entrepreneurship plays an important role in solving student employment problems and promoting sustainable social and financial development through a new form of sustainable entrepreneurship. However, the previous studies did not provide sufficient reasons for how the psychological factors of the simultaneous generation of social, ecological and economic value affect the intention-forming process of sustainable entrepreneurs. Such an understanding has led to a developing interest in the exploration of entrepreneurial intentions across different types of entrepreneurship, particularly from the perspective of sustainability. The aim of the study is to observe the effects of entrepreneurial self-efficacy, proactive personality and creativity variables, the recognition of opportunities as well as sustainable entrepreneurial intention. This study quantitatively analyzed the data of 500 university students from Punjab, Pakistan. These data were used for structural equation modeling. The results of the study indicated that entrepreneurial alertness has a mediating effect between entrepreneurial self-efficacy, proactive personality, creativity, and has an impact on the recognition of opportunities as well as the intention of sustainable entrepreneurship. These findings further spotlight the importance of recognition of opportunities in the implementation of sustainable entrepreneurship. In fact, the results suggest that scholars and practitioners can use social cognitive theory and personality traits to stimulate the development of techniques, thereby promote sustainable entrepreneurial intention.

**Keywords:** Entrepreneurial self-efficacy, creativity, proactive personality, sustainable opportunity recognition, sustainable entrepreneurial intention

## 1. Introduction

Over the past few decades entrepreneurship has been found to be a promoter of monetary

activity that has attracted great interest because it has a major impact on the prosperity of a region or country (Crijns & Vermeulen, 2007; Karimi, Biemans, Lans, Chizari, & Mulder, 2016). Exposure of the new businesses is crucial because it create jobs, drive innovation and increase competence in different economic sectors (Crijns & Vermeulen, 2007; Dees, 2017). This is generally interpreted as economic and non-economic gains for the individual economy and society sustainably promotes entrepreneurship (Shepherd & Patzelt, 2011; Stubbs, 2017). The unique challenge of effectively launching a sustainable business may be the only reason for the low engagement presently (Dees, 2017; Muñoz, 2018). The potential of a

<sup>a</sup>School of Economics and Management, Northwest University, Xi'an, 710127, Shaanxi, P.R. China.

<sup>b</sup>School of Management Sciences, Northwestern Polytechnical University, Xi'an, 710072 Shaanxi, P.R. China.

<sup>c,d,h</sup>School of Economics and Management, Shaanxi University of Science and Technology, Xi'an, 710021, Shaanxi, P.R. China.

<sup>e</sup>Total Quality Management, University of the Punjab, Lahore, 54590, Punjab, Pakistan.

<sup>f</sup>ORIC, University of veterinary and Animal Sciences, Lahore, 54000, Punjab, Pakistan.

<sup>g</sup>Faculty of Management Studies, University of Central Punjab, Lahore, 54590, Punjab, Pakistan.

<sup>a,h</sup> Equal Contributor

\*Corresponding Author: Nosheena Yasir

Email: nosheena.yaqoob@yahoo.com (Nosheena Yasir), anlr@tom.com (An Liren)

sustainable entrepreneurs will undoubtedly affect the excitement of employees, weighing the triple bottom line, economic benefits and the establishment of environmental and social value on a generally large social scale. These issues can affect people's goal of starting a sustainable business, with the intention of being largely noticeable as they are the most dominant and neutral divination behavior of entrepreneurship (Krueger Jr, Reilly, & Carsrud, 2000; Vuorio, Puumalainen, & Fellnhofer, 2018). Thus, researchers of sustainable entrepreneurship continue to provide empirical results showing the impact of entrepreneurial self-efficacy on entrepreneurial intention and new business creation (Sequeira, 2004). Recently, it was stated that the role of specific self-efficacy (entrepreneurial self-efficacy) and personality traits (proactivity and creativity) in these tasks is limited to the individual's intention to become sustainable entrepreneurs (B. Fuller, Liu, Bajaba, Marler, & Pratt, 2018; Hu, Wang, Zhang, & Bin, 2018).

We proposed that entrepreneurial attention can play an important role in the relationship between the specific tasks of self-efficacy, personal traits and outcome of the sustainable entrepreneurial intention. Current study focuses on the business environment research paradigm especially in terms of: (1) personal traits based on personality factors (Obschonka, Silbereisen, & Schmitt-Rodermund, 2010); (2) developing the cognitive concept-based complete entrepreneurial model to justify entrepreneurship curiosity using traditional practices focused on the entrepreneurial event model (SEE) and planned behavior model (TPB) (Ali, Shah, & Anwar, 2019; Karimi et al., 2016); (3) through the study of the business environment perspective, it mainly deals with the design and components of business context and environment (Aleidi & Chandran, 2017; Baojuan & Xiaoting, 2017). However, previously it was described that recognition of the opportunities to detect sustainable development require an understanding of the natural/public environment and the interactions between individual entrepreneurial expertise, altruism, and the identification of ways to improve sustainable and personal threats to the entrepreneur (Patzelt & Shepherd, 2011).

Therefore, it is recommend that using both cognitive factors (entrepreneur self-efficacy) (C. C. Chen, Greene, & Crick, 1998) and personality traits (proactivity and creativity) (Bogatyeva, Edelman, Manolova, Osiyevskyy, & Shirokova, 2019; Zampetakis, 2008) helps to further explore the

entrepreneurial attention of opportunity recognition for a sustainable entrepreneurial environment. Reportedly, Boyd and Vozikis (Boyd & Vozikis, 1994) stated the importance of this process for the opportunity "a person only initiates entrepreneurial action when self-efficacy with the perceived demands of a particular opportunity is high." Researchers believe that entrepreneurial self-efficacy is an important prerequisite for opportunities recognition. Therefore, the establishment of the entrepreneurial process is an occasion to design the latest services and products through creativity (Gielnik, Frese, Graf, & Kampschulte, 2012). Furthermore, ward and coworkers mentions that new and useful ideas are the driving force behind sustainable entrepreneurship (Ward, 2004). Similarly, the effect of a proactive personality shows that a person's potential is recognized to meet challenges arising from situational forces and that changes are made in the environment that "challenge the status quo, rather than stagnation reshaping to create situations" (Bateman & Crant, 1993). Hansen et al. stated that proactive personality and creativity are the most important aspects of business goal transformation, as they can be closely related to the opportunity identification and these are the dominant traits in fostering new organizations (Hansen, Shrader, & Monllor, 2011). So the people who come up with sustainable development need to think about the positive impact of action to remind entrepreneurial alertness. Therefore, the purpose of this study is to incorporate these findings into the theory of entrepreneurial alertness to provide an explanation for the intention formation of sustainable entrepreneurship. In particular, the purpose is to adapt and expand the existing entrepreneurial intention model by incorporating cognitive theory (entrepreneurship self-efficacy) and psychological factors (creativity and active personality) into the identification of opportunities and applying the model to sustainable entrepreneurship by specific context. Simultaneously, this research will anticipate a reference for identifying talent with strong entrepreneurship and recommendations for universities to preferably assist students in starting their own business and promoting sustainable entrepreneurs through entrepreneurial education. Based on literature review, we hypothesize how entrepreneurial self-efficacy, proactive personality and creativity outcomes can effect on the specific levels of sustainable entrepreneurship in intention formation.

## 2. Theoretical paradigm of sustainable intention and Hypotheses

The definition of entrepreneurship is combined with the environmental impact specified by Venkataraman (Venkataraman, 2019). The framework for estimating performance in three dimensions of economic, social and environmental performance is the Triple Bottom Line (TBL), economic, social and ecological values encourage businesses to work together (Elkington, 2001). Sustainable development through commercial entrepreneurship is the goal of sustainable entrepreneurs (Schaltegger & Wagner, 2011). Thus, there is to initiate two types of values that are improved (economically) and (socially and environmentally) surpass each other through pro-social and pro-environmental friendly (Dees, 2017; Shepherd & Patzelt, 2011). According to the previous study, entrepreneurial self-efficacy is positively related to the formation of sustainable entrepreneurial intention (Mauer, Neergaard, & Linstad, 2017). Entrepreneurial self-efficacy is also influenced by environmental factors and social models, which are both hurdles and catalysts. Entrepreneurial self-efficacy adds up to the emotional mechanism that is critical for an individual to understand that they are skillful enough to perform various tasks in a complicated environment (Ciuchta & Finch, 2019). Entrepreneurial self-efficacy therefore means realizing the potential value of a new idea, trusting an independent in his or her potential, having confidence, convincing others to support an idea, being confident in convincing an independent person to believe in that potential, to convince others to support the idea, and team members for corporate activities like marketing and alliances, innovation, management, risk-taking, and financial control. People are more perceptive on business details such as policy, regulation and finance by showing a higher level of business self-efficacy (Bandura, 2000) that encourages individuals to trust themselves in enhancing their ability to conduct business. Sustainable entrepreneurship can turn upcoming services and products into reality and create new value for economic, social and environmental benefits (Hsu et al., 2019).

This process shows and extends the paths of sustainable entrepreneurial intention (Cohen & Winn, 2007). So, Chen and colleagues, therefore defined intention into two types; active and passive (J. Chen, 2015). Independent trust can be productive and the initiative to be taken has to do with the active type. If people start their own

business without being satisfied with the conditions and conditions of employment, it is related to the passive type (Yan, Gu, Liang, Zhao, & Lu, 2018). In this study, the entrepreneurial intention type is used as an active type. The entrepreneurial intention to pursue many jobs at one point through entrepreneurial action is related to active sustainable entrepreneurship (Schaltegger & Wagner, 2011). However, the role of job-specific self-efficacy perspectives, such as entrepreneurial self-efficacy, and related ethical requirements in entrepreneurship research, suggest that there is a positive link between entrepreneurial self-efficacy and sustainable entrepreneurial intention. So, we hypothesized the following;

**H1.** There is a positive relationship between entrepreneurial self-efficacy and sustainable entrepreneurial intention

### 2.1 Entrepreneurial self-efficacy, opportunity recognition and sustainable entrepreneurial intention

The social cognitive theory, formally proposed by Bandura, defines self-efficacy that includes not only the behavior itself, but also the social environment and cognitive factors (Bandura, 1977; Hsu et al., 2019). Recognizing opportunities is an independent, repetitive, nonlinear, and complex process that is heavily influenced by self-efficacy. Since its introduction in literature, entrepreneurial self-efficacy has played an important role in the study of entrepreneurial intentions, interests, and entrepreneurship (C. C. Chen et al., 1998; Utami, 2017). However, the authors suggest that individuals can reinforce self-efficacy through active mastery or repetitive achievement, especially in task-specific configurations such as entrepreneurial self-efficacy (Saraih et al., 2018). Pointing out the importance of this process at the event, Boyd and Vozikisthen reported that a person will only start entrepreneurship when there is a high self-efficacy for perceived demand for a particular opportunity (Boyd & Vozikis, 1994; Hsu et al., 2019). Interestingly, researchers argue that entrepreneurial self-efficacy is the primary reason for identifying opportunities (Wen-pei, 2016). Then the investigation of entrepreneurial self-efficacy and its possible influence on the recognition of opportunities is conceptual, since a lot of work has been done (Park, 2005). It was recognized that Recognized that an unfavorable external environment could make entrepreneurs more vigilant. Humans not only "react" but also "do something" with the environment (Tushman &

Anderson, 1986; Yu, 2001). Therefore, entrepreneurs need a high level of trust and self-confidence in order to capitalize on possible opportunities. Correspondingly, when these attentive entrepreneurs repeatedly search for patterns of opportunity, they are more likely to see new opportunities through this level of self-efficacy, which increases the entrepreneur's self-efficacy (Hu & Ye, 2017). So, it is predicted as follows:

**H2.** There is a positive relationship between entrepreneurial self-efficacy and opportunity recognition

**H3.** There is a positive relationship between entrepreneurial self-efficacy and entrepreneurial alertness

## 2.2 Creativity and entrepreneurial alertness

Sustainable entrepreneurial intention is a key motive for creativity (Fatoki, 2010), and creative people demonstrate a high level of entrepreneurial desire (Liu, Yin Ip, & Liang, 2018; Zampetakis, 2008). Social entrepreneurs, in particular, try to develop creative mechanisms to avoid environmental fences (Dacin, Dacin, & Matear, 2010). According to Amabile, the company's ability to discover and capitalize on business opportunities, create and implement creative ideas that help to start a new business or activate an existing organization is related to entrepreneurial creativity (Amabile, 1997; Biraglia & Kadile, 2017). Therefore entrepreneurial creativity can be measured in two areas, namely originality, and usefulness. More recently, Kirzner (Kirzner, 2009) mentions that entrepreneurial alertness contain innovative measures that affect activities that could be carried out in the future. Kirzner's literature has accepted that the goal of his work is not the antecedents of alertness, but discovering its consequences (Kirzner, 2009). Creativity is associated with the initial distinctions people make and shows the possibility of the existence of sustainable entrepreneurial opportunities (Tang, Kacmar, & Busenitz, 2012), but antecedent of entrepreneurial alertness through non-research has addressed creativity openly. Especially when it comes to scanning and searching, Campos (2016) and Obschonka (2017) have empirically confirmed that creativity has a significant relationship with entrepreneurial alertness (Campos, 2016; Obschonka, Hakkarainen, Lonka, & Salmela-Aro, 2017). A model was used in the mediation and moderation by Campos to identify a positive correlation between creativity and entrepreneurial

alertness (Campos, 2016). Therefore, the following hypothesis is proposed:

**H4.** There is a positive relationship between creativity and entrepreneurial alertness

## 2.3 Relationship between proactive personality, alertness, and intention of sustainable entrepreneur

In the current study, entrepreneurial alertness is also associated with an active personality. "An individual's active attempt to change the environment is associated with proactivity" (Delle & Amadu, 2016; Zampetakis, 2008). According to Bateman and Crant (Bateman & Crant, 1993), it affects the environment of people with an active personality and even increases their urge to change the environment. Therefore, recognizing opportunities for dominance, opportunities for proactive evaluation, and impacting the environment to bring about significant change through a proactive personality can help individuals reduce the constraints of the situation (Bateman & Crant, 1993; Crant, 1995). Proactive people are plausible to succeed opportunities for proactive evaluation and impacting the environment to bring about significant change through a proactive personality can help individuals reduce the constraints of the situation. Further empirical studies have confirmed this (Marler, Botero, & De Massis, 2017). The central prerequisite for the entrepreneurial alertness of opportunities is observed by the proactive personality, an important aspect of the initiative is identifying opportunities (Ardichvili, Cardozo, & Ray, 2003; B. Fuller et al., 2018; J. B. Fuller, Marler, & Hester, 2006). Due to the diverse environmental challenges that many people face, their business ideas are not about real start-up companies. Such an attitude is a special requirement for interpreting business intentions into actual behavior (Griffiths, Gundry, & Kickul, 2013). Therefore, the following hypothesis are proposed;

**H5.** A proactive personality has positive impact on alertness to start a sustainable venture

**H6.** A proactive personality has positive impact on intention to start sustainable venture

## 2.4 Relationship between alertness, recognition of opportunity, and sustainable intention of entrepreneur

Alertness was about the development of many "opportunities", especially in the search for entrepreneurship. Some of these studies argue that opportunities are either come upon or generate

(Short, Ketchen Jr, Shook, & Ireland, 2010). Another perspective carve up it into the three domains; opportunity creation, opportunity recognition, and opportunity discovery (Sarasvathy, Dew, Velamuri, & Venkataraman, 2003). Previous studies found that entrepreneurial alertness has a positive correlation with entrepreneurial intention (Hu et al., 2018; Neneh, 2019). The process begins with the ability to explore the opportunity and the endless evolution of the individual in order to turn that opportunity into reality (Campos, 2016).

Based on this perception, Miao believes that entrepreneurial alertness is an intellectual design and psychological strategy to persuade entrepreneurs to more accurately recognize facts, process and evaluate knowledge (Miao & Liu, 2010). According to McMullen and Shepherd, alertness is entrepreneurial only when it requires discernment and fluctuation to act. Sustainable entrepreneurial intention play an important role in shaping the individual's sustainable entrepreneurial behavior (McMullen & Shepherd, 2006; Obschonka et al., 2017). From the Chinese point of view, Li et al. (Li, Wang, & Liang, 2015), using social cognitive theory to identify entrepreneurial alertness is an important strength for entrepreneurs as it directly predicts the identification of opportunities. Furthermore, Hu and Ye (Hu & Ye, 2017), entrepreneurial self-efficacy and vigilance of the key cognitive forecasters for sustainable entrepreneurial intention using a sample of 364 Chinese sports students. From these earlier perspectives, we formulated the following hypothesis;

**H7.** There is a positive relationship between entrepreneurial alertness and opportunity recognition

**H8.** There is a positive relationship between entrepreneurial alertness and sustainable entrepreneurial intentions

## 2.5 Recognizing opportunities and the sustainable intention of an entrepreneur

The development of innovative business models and radical technologies through market transformation and environmental humiliation can provide significant opportunities. Empowering entrepreneurs to develop sustainable entrepreneurship that can that can bring economic benefits through these opportunities (Cohen & Winn, 2007; Venkataraman, 2019). Market uncertainty can generate the idea of starting a new entrepreneurial by capitalizing on opportunities found through environmental disruption.

Individuals who are interested in social issues and are interested in environmental issues can try to identify the market segments that cope with the issues and bring the environment to the desired state. Martin and Osberg (Martin & Osberg, 2007) are social entrepreneurs, they tend to target mishandled market segments to turn them into entrepreneurial opportunities. Initiate major social problems and market transformations in the community to find solutions to problems that are likely to be identified (Ardichvili et al., 2003). We formulated the following hypothesis;

**Hypothesis 9.** An opportunities recognition has positive impact on intention to start sustainable venture.

## 2.6 The function of alertness as mediator of the study

Entrepreneur alertness have a complete mediating effect on the relationship between sustainable intentions and active personality in a preliminary domain study of 735 Chinese students, and entrepreneurial vigilance positively influence the sustainable intentions of entrepreneurs (Hu et al., 2018). We formulated the following hypothesis;

**H10a.** Entrepreneurial alertness will mediate the relationship between entrepreneurial self-efficacy and opportunity recognition

**H10b.** Entrepreneurial alertness will mediate the relationship between entrepreneurial self-efficacy and sustainable entrepreneurial intention

**H11a.** Entrepreneurial alertness will mediate the relationship between creativity and opportunity recognition

**H11b.** Entrepreneurial alertness will mediate the relationship between creativity and sustainable entrepreneurial intention

**H12a.** Entrepreneurial alertness will mediate the relationship between proactive personality and opportunity recognition

**H12b.** Entrepreneurial alertness will mediate the relationship between proactive personality and sustainable intention of an entrepreneur

Proposed model of the study presented in Figure.1

## 3. Research Method

### 3.1 Research Design

Data was collected through a survey for this study. We used a sample of students because deliberate strategies are very careful in short term situations. Consistently, it is difficult to achieve a sustainable entrepreneurial intention that engages those who do not want to start a sustainable business prior to actual action (Krueger Jr et al.,

2000). We conducted a theoretical surveys using a four-step approach (Forza, 2002). First, the theoretical point of view is to recognize the assembled conjecture elements. Second, we used professional interviews to check if the questionnaire elements were valid. Third, a pilot survey is conducted with 40 people to confirm the reliability and validity of the questionnaire element. Fourth, the second pilot study is used to reaffirm the validity and credibility of the individual items with 60 respondents after slightly changing the wording of the items that occurred in the first pilot study.

### 3.2 Measurement Scale

In this research model, the variable measurement objects were taken from a questionnaire of local and international studies. The specificity of the model, correctly adjusted by these factors, was established. The model includes six variables: entrepreneurial self-efficacy, active personality, creativity, vigilance, recognition of opportunities, and the entrepreneur's sustainable intention. Respondents' attitudes change gradually from "strongly disagree" to "strongly agree". Of the 500 survey members, we used a 5-point Likert scale on a scale of 1 (strongly disagree) to five, 5 (strongly agree). To measure the scale, entrepreneurial self-efficacy was used, and a new formula was created from Lucas and Cooper (Lucas & Cooper, 2004). This scale should primarily have a leadership style and should convince an individual's belief in the ability to see opportunities. Four points from previous studies were used to measure proactive personality (Bateman & Crant, 1993; Kickul & Gundry, 2002). "The six indicators include the Entrepreneurial alertness mentioned in Miao Qing's study (Miao & Liu, 2010). The recognition of opportunities is indicative of Huang's research and has included five measuring points (George, Parida, Lahti, & Wincent, 2016). So, the measure of creativity was carried out using five items covered by Baron and Tang (R. A. Baron & Tang, 2011; Perry-Smith, 2006). Five evaluation points with sustainable entrepreneurial intention were derived from Brenner's study (Brenner, Pringle, & Greenhaus, 1991). All measures are listed in table 1.

### 3.3 Participants

The data was collected from recent universities graduates (Bachelor's and Master's) with specific intentions to engage in entrepreneurial activities consisting of startups. Since the objectives of sustainable entrepreneurship are critical to

choosing entrepreneurship methods and goals, many entrepreneurship researchers have established the use of student samples (Hechavarria et al., 2017; Liñán & Chen, 2009). This study used a convenience sampling technique that was largely rejected in entrepreneurship studies, despite concerns about the possibility of generalization (Kautonen, Van Gelderen, & Fink, 2015; Krueger Jr et al., 2000; Wilson, Kickul, & Marlino, 2007). Participants were recruited from the graduates of four different universities from Punjab, Pakistan. Data collection took place at the beginning of the fall 2019 semester and lasted 10 weeks. Of the total 575 questionnaires retrieved, 500 were finally used to eliminate questionnaires with missing data and incorrect answers. It was provided to students in electronic and paper format with the help of the department head. This corresponds to a response rate of 86.9%. A total of 75 questionnaires were discarded due to incomplete answers. The sample included 385 men (39.4%) and 115 women (11.8%). Most of them were masters (275 (28.1%)), bachelors 195 (20.0%), and others 30 (3.1%) last year. Students were selected from two faculties. Business administration 205 (21.0%), Engineering 263 (26.9%), other disciplines 269 (44.8%), 32 (3.3%). Age of respondents between 20 to 40 years, entrepreneurship education 318 (32.5%), 90 (9.2%) received parental entrepreneurial exposure and entrepreneurial prior knowledge 82 (8.4%), descriptive statistics listed in table 2. It shows the demographic distribution of the samples used here.

### 3.4 Control variables

The control variable, consisting of age and gender, is a factor that is closely related to business start-up. Although there is a lot of research on whether women are less entrepreneurial in general, it is unlikely that older people will be reluctant to start a new business (Hatak & Snellman, 2017; Kautonen et al., 2015; Shinnar, Hsu, Powell, & Zhou, 2018). Respondents asked 1 male and 0 female by gender to suggest age composition in the following groups. Up to 20-25 years old (code = 1); 26 to 30 years old (code = 2); 31 to 35 years old (code = 3), 35 to 40 years old (code = 4).

### 3.5 Analysis Method

We used the AMOS 21 analysis software to explore the information (Arbuckle, 2011) and used a two-step structural equation estimation method that was facilitated using this method to test the

relationship between the study variables (Anderson & Gerbing, 1988), to test the relationships between study variables with the AMOS 21 analysis software. SEM was also used in this study. Extensive studies have been conducted to analyze the confirmatory factors and to verify the influence values for each correlation (Chang, Van Witteloostuijn, & Eden, 2010; Jackson, Gillaspay Jr, & Purc-Stephenson, 2009; Schreiber, Nora, Stage, Barlow, & King, 2006). In this study, SEM examined twelve hypotheses.

### 3.6 Common Method Bias

It was a cross-sectional study submitted as a means of minimize CMV (Chang et al., 2010). Harman's single factor test was used to assess Common Method Bias (CMV) in the current work (Harman, 1976). The results show that the first factor only accounts for about 20% of the variance that did not exceed the 40% threshold (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Therefore, the common method dispersion in our study is unlikely to be a threat.

## 4. Results

### 4.1 Measurement of the model

Confirmation Factor Analysis (CFA) is used to confirm factor loading in a measurement model composed of sustainable entrepreneurial intention. All reflective items loading were above the 0.7 thresholds (see Table 4) and met the required criteria (Shook, Ketchen Jr, Hult, & Kacmar, 2004). The Cronbach alpha coefficient recommended a typical value of 0.07 and ranges from 0.745 to 0.940, specify that the scale chosen is very reliable (Nunnally, 1978). Likewise, 0.70 is considered desirable when determining the internal consistency confidence for a metric model. This is because the sample implies that the accumulated facts about the metric version are strong with the stated internal consistency (Hulland, Chow, & Lam, 1996). The mean of the extracted variances (AVE) for each individual construct by each factor should be greater than 0.5. Each factor can explain the measurement dimension well (Fornell & Larcker, 1981). Multicollinearity problems were not found because all VIF were lower than 5 (J. Hair, Andreson, Tatham, & Black, 1998). Therefore, the factor structure and construct validity were examined using the hypothetical scenarios that corresponded to the theoretical structural model. It is also suggested that at least the following indices should be reported ( $\geq 0.90$ ) including the relative fit indices (NFI), (GFI), (RFI) and (AGFI) (Steiger, 2007).

However, statistical significance for the comparative fit index (CFI) should be greater than 0.950, (RMSEA) and (RMR) should be less than 0.080 and 0.050 respectively (Tabachnick & Fidell, 2007).

Fornell-Larcker criterion is used to evaluate the construct reliability and the discriminant validity in the sense achieved while the square root of AVE is greater than the corresponding correlations between the inter-construct correlations (table 5) (Fornell & Larcker, 1981).

### 4.2 Structural Model

Figure 2 represents the hypothetical conceptual model of this study and table 6 shows the significant and satisfactory goodness of the fit indices. Several parameters defined as the standard Marsh and colleagues 1985  $\chi^2 = 4481.422$  ( $P < 0.001$ ),  $df = 2696$ ,  $\chi^2/df = 1.662$ ,  $GFI = 0.931$ ,  $AGFI = 0.902$ ,  $RFI = 0.946$ ,  $NFI = 0.950$ ,  $CFI = 0.901$ ,  $RMSEA = 0.036$  and  $RMR = 0.05$  (Marsh & Hocevar, 1985). In this study, we performed a mediation analysis using the bias-corrected bootstrapping method recommended by Preacher and Hayes in 2008 (Preacher & Hayes, 2008). We used an experimental paradigm to test the mediation effect of bias-corrected bootstrapping. The confidence interval was set at 95% and with 2000 iterations and the significance levels tested were  $\alpha$  is 0.05.

We found support for the direct effect of student's gender ( $\beta = 0.119$ ,  $p = 0.001$ , significant), and age ( $\beta = 0.113$ ,  $p = 0.016$ , significant) on an entrepreneur's sustainable intention, the proportion of variance in the sustainable intention. It was explained by the collective set of predictors was 42.4%. This compares favorably with previous research, where sustainability was used to explain students' entrepreneurial intentions. In this study, a pathway analysis was performed based on the hypothesis described in Figure 2. The effect shown in Table 7 is that entrepreneurial self-efficacy was converted to a positive correlation with sustainable entrepreneurial intention H1 ( $\beta = 0.382$   $p < 0.001$ ), and opportunity recognition was H2 ( $\beta = 0.071$   $p < 0.05$ ) and entrepreneurial self-efficacy was positively associated with the alertness of the entrepreneur H3 ( $\beta = 0.077$   $p < 0.01$ ). Therefore, H1, H2, and H3 were supported in the study. Similarly, creativity is clearly linked to the entrepreneurial alertness H4 ( $\beta = 0.270$   $p < 0.001$ ).

Conversely, a proactive personality has a positive relationship with entrepreneurial alertness H5 ( $\beta = 0.168$   $p < 0.001$ ), whereas a proactive personality is also positively and directly linked to

sustainable entrepreneurial intention H6 ( $\beta=0.031$   $p<0.001$ ). The results also suggest that the entrepreneurial alertness is definitely associated to opportunity recognition H7 ( $\beta=0.163$   $p<0.05$ ) and sustainable intention of an entrepreneur H8 ( $\beta=0.251$   $p<0.001$ ). Finally, the opportunity recognition was confidently associated with sustainable entrepreneurial intention H9 ( $\beta=0.191$   $p<0.013$ ). H 9 was supported by the study and the results are shown in Figure 2.

#### 4.3 Mediating effect of entrepreneurial alertness

We bootstrapped 2000 iterations to investigate the intermediary role of EA, which we use for the analytical method recommended by Preacher and Hayes (Preacher & Hayes, 2008). The results showed that the indirect effect of entrepreneurial self-efficacy on the recognition of opportunities and the sustainable entrepreneurial intention of EA, H10a (ESE  $\rightarrow$  EA  $\rightarrow$  OR) or EA, H10b (ESE  $\rightarrow$  EA  $\rightarrow$  SEI) is significant, especially with simulated statistics different from 0.05 and the 95% confidence interval from the lower to upper limit excluding 0, as shown in Table 7. With regard to the hypotheses 10a and 10b, we found that entrepreneurial self-efficacy has a significant positive direct influence on sustainable intention and on the recognition of opportunities through entrepreneurial alertness and support. It is checked whether the mediation effect partial or complete. We examine the direct effects of entrepreneurial self-efficacy on sustainable entrepreneurial intention and the recognition of opportunities. It was reported that the mediation effect can only occur if the predictor significantly influences the dependent variable. This means that either full or partial mediation must be established (R. M. Baron & Kenny, 1986). In this study, entrepreneurial self-efficacy predicted sustainable entrepreneurial intention ( $\beta=0.382$ ,  $p<0.001$ ), and opportunity recognition ( $\beta=0.071$   $p<0.05$ ), suggesting that entrepreneurial alertness partially mediated the effect of entrepreneurial self-efficacy on sustainable entrepreneurial intention and opportunity recognition. Additionally, we suggested in hypotheses 11a and 11b that entrepreneurial alertness would mediate the effect of creativity on the recognition of opportunities or sustainable entrepreneurial intention. The finding demonstrates that the indirect effect of creativity on the recognition of opportunities through entrepreneurial boundaries (CR  $\rightarrow$  EA  $\rightarrow$  OR) was statistically significant. However, as a result of this study, the indirect effect of creativity on sustainable

entrepreneurial intention through entrepreneurial alertness was statistically significant by 95%, and the confidence interval of "(CR  $\rightarrow$  EA  $\rightarrow$  SEI)" was found to deviate from lower limit to the upper limit without zero. Therefore, Hypothesis 11a and Hypothesis 11b were supported and partially mediating since the direct effect of creativity on alertness was ( $\beta=0.270$ ,  $p<0.001$ ). Hypotheses 12a and 12b suggested that proactive personality would have an indirect effect on the recognition of opportunities or sustainable entrepreneurial intention through entrepreneurial alertness. The results showed, that the 95% confidence interval is statistically significant and that "entrepreneurial alertness (PP  $\rightarrow$  EA  $\rightarrow$  OR)" and "EA (PP  $\rightarrow$  EA  $\rightarrow$  SEI) differ from the lower to the upper limit without zero. Therefore, entrepreneurial alertness mediated the effect of proactive personality on the recognition of opportunities or a sustainable entrepreneurial intention that support hypotheses 12a and hypothesis 12b. Our results examined a significant association between the direct impact of a proactive trait on an entrepreneur's sustainable intention ( $\beta=0.168$   $p<0.001$ ). Therefore, hypothesis 12b entrepreneurial alertness has a partial mediation between a proactive personality and sustainable entrepreneurial intention.

#### 5. Discussion

The aim of this study was to investigate the mediation effects of entrepreneurial alertness in order to examine the specific mechanism of the effects of entrepreneurial self-efficacy, creativity and proactive personality and opportunity recognition on the sustainable entrepreneurial intention of university students in order to know how sustainably entrepreneurs can be promoted. We have developed and assessed these issues taking into account cognitive and personal factors with sustainable business intent in mind. Embark on a previous study focused on the value of the paintings with considerations for sustainable business intention (Vuorio et al., 2018).

First, the current study on entrepreneurial self-efficacy could positively influence the sustainable entrepreneurial intention of university students. The results showed that ESE has a significant impact on SEI. We found that more confident university students have higher levels of entrepreneurial self-efficacy and a greater ability to process and accept external information. With regard to the findings on ESE, our findings build on previous research and those of others agree with the theory of the study of social knowledge. Regarding the results on ESE,



our results build on previous research, and others agree with the theory of the study of social knowledge (Bandura, 2014; McGee & Peterson, 2019; Utami, 2017).

Secondly, we tested H2 and H3 hypothesis, which have a positive significant influence of ESE on the recognition of opportunities and alertness, respectively. Regarding the direct impact of ESE, it has been suggested that entrepreneurial self-efficacy inspires and stimulates entrepreneurs to see opportunities and a high level of awareness of their surroundings in order to start new businesses. Our results are in consistent with the previous findings (Hu et al., 2018; Saraih et al., 2018). In addition, these results provide empirical evidence of the importance of socio-cognitive theory, and in particular entrepreneurial self-efficacy, as a useful framework for predicting the spotting of opportunities. Thus, the relationship between entrepreneurial self-efficacy and entrepreneurial alertness shows that greater recognition of opportunities and the sustainable entrepreneurial intention of an entrepreneur are higher than the entrepreneur alertness. Hence, the results are consistent with Tang research finding that entrepreneurial self-efficacy is a moderator of the relationship between environmental compatibility and entrepreneurial alertness (Tang, 2008).

Thirdly, the study empirically confirms H4 and H5, which determine whether the evaluation of proactive personality and creativity has a profound effect on alertness through the path coefficient of structural equation model. The results of the study are in consistent with previous studies (Hu et al., 2018; Zampetakis, 2008). Likewise, the proactive personality of H6 has an excellent influence on sustainable entrepreneurial intention. The active attempt of the individual is linked to a proactive personality to influence his dynamic environment. Because of this, proactive and creative people are more inclined and take the best initiative for the environment. This would also be beneficial for students who have already developed a sustainable business intent, as the results have also supported previous research (Santos, 2012; Schaltegger & Wagner, 2011).

Fourthly, in hypotheses 7 and 8 this is also a confirmation and significant factor of entrepreneurial alertness in recognizing opportunities and sustainable entrepreneurial intention (Figure 2).

A high level of alertness among individuals has been able to identify and recognize the opportunities and they are more likely to be

competitors in starting their business because they have the intelligence and see suitable opportunities in the competitive market (Shamsudeen, Keat, & Hassan, 2017). Entrepreneurial alertness is positively associated with sustainable business intention because of its three-dimensional search, scanning, information and connection, evaluation and judgment. The present findings are in consistent with an earlier study (Neneh, 2019).

Fifthly, confirm empirically that recognition of opportunities has a positive impact on sustainable entrepreneurship intention. When examining the intention of entrepreneurship, the recognition of opportunity is low compared to the intention of sustainable entrepreneurship because the recognition of opportunity is high. This finding goes against the positive effects of entrepreneurship in identifying sustainability opportunities. This finding is consistent with the study of the dual concept of sustainable entrepreneurship and sustainability through sustainable entrepreneurship (Schaltegger & Wagner, 2011).

Finally, entrepreneurial self-efficacy, creativity, and proactive personality factors are predictors of the study. The results have shown that entrepreneurial self-efficacy, creativity, and proactive personality have an indirect impact on opportunity recognition and sustainable entrepreneurial intention through entrepreneurial alertness that support hypothesis H10a, b and H12a, b. As a result, the role of entrepreneurial alertness was revealed. It is a valuable association and has a direct impact on the entrepreneur alertness towards sustainable entrepreneurial intention (McMullen & Shepherd, 2006). The results showed that entrepreneurial alertness are important in finding the impact of personality traits on entrepreneurial intentions. Cognitive variables played an important role in developing theories related to the entrepreneurial system developed for the study of entrepreneurship (Frank, Lueger, & Korunka, 2007; Krueger Jr et al., 2000).

## **6. Practical and theoretical implication**

The present study suggests some theoretical and practical implications for academician, scientists, and policy makers. This study highlights the significant effects of entrepreneurial self-efficacy, proactive personality, and creativity with the mediation effect of entrepreneurial alertness on the recognition of opportunities and sustainable entrepreneurial intention. This study contributes to the social cognitive theory of these variables to highlight the sustainable entrepreneurial intention

(Bandura, 1977; Wen-pei, 2016). The study extends conventional entrepreneurial intention to sustainable entrepreneurial intention. Therefore, the current study not only enriches research into sustainable entrepreneurial intentions, but also contributes to enriching the research perspective of entrepreneurial self-efficacy, the proactive personality of creativity and the influence of opportunity recognition on sustainable entrepreneurial intentions. It can be stated that there is a direct path from entrepreneurial alertness to opportunity identification and entrepreneurship (McMullen & Shepherd, 2006) as sustainable entrepreneurship has moved beyond social and environmental issues and is shifting to effectiveness and economic value (Young & Tilley, 2006). It contributes to the field of entrepreneurship research by showing that cognitive variables play a crucial role in developing theories related to the sustainable entrepreneurial process (Schaltegger, Hansen, & Lüdeke-Freund, 2016). The study has some practical implications for the government education departments and institutions currently working on sustainable development, as well as the entrepreneurial skills and potential of students.

Firstly, previous studies that focused on business intention were less focused on sustainable business intention. Hence, this study offers a new direction to encourage students to move from entrepreneurial intention to energetic step in order to become sustainable entrepreneurs. Secondly, entrepreneurial self-efficacy increases student awareness. Students with a high degree of entrepreneurial self-efficacy are therefore more likely to motivate opportunities for recognition and act according to sustainable entrepreneurial intention. Therefore, entrepreneurial self-efficacy is crucial to find talent through various training courses and seminars that lead to the creation of a sustainable entrepreneurial intention. Thirdly, previous studies have found that the high levels of entrepreneurship among college students were not fully explained by sustainable entrepreneurship. Hence the proactive personality and creativity to motivate students to have sustainable entrepreneurial intention. Fourthly, sustainable entrepreneurship is essential to developing a sustainable entrepreneurial process that leads to sustainable entrepreneurship.

### 7. Limitations and future prospective

There were various limitations and future prospects for this study.

First, this cross-sectional design was used to analyze the relationship between variables. All of this has changed over the years and the environment, which has made it difficult to establish causal relationships. To determine what most of the variables are looking for, future studies should measure the predictors, mediators, and outcomes individually by setting a time period and measuring at least three times. Such a longitudinal design could reveal informal relationships.

Second, the variables used in the current study were changed on the study scale to reflect conventional entrepreneurial intentions, so the assessment of the entrepreneur's sustainable intentions has not been modified. In addition, an appropriate scale of sustainable entrepreneurial intention should be developed for future studies. The goals of this scale should be measured against sustainable entrepreneurship.

Third, the statistical samples are limited to the engineering and business department. Future research will require collecting facts from various university institutions. In order to generalize the results, studies in large and less sustainable countries are needed. In the future, other dominant control variables may be highlighted, such as previous entrepreneurial experience and education, as well as entrepreneurial risk taking and enthusiasm for studying the intentions of sustainable entrepreneurship.

### 8. Conclusion

This paper should fill the gaps associated with empirical issues in shaping the intention method of sustainable entrepreneurship outcomes in terms of the triple bottom line of social, environmental and economic needs. Current considerations help to understand the association between entrepreneurial self-efficacy, creativity and character and proactive personality of opportunities recognition/sustainable entrepreneurial intentions by examining the mediation of entrepreneurial alertness. This study promotes an understanding of the antecedents and consequences of alertness and provides implications for sustainable corporate intention. We hope that our results will leave an exciting research pathway and help practitioners encourage the choice of attractive sustainable entrepreneurs.

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## References

- [1] Aleidi, A., & Chandran, D. (2017). *Does Institutional Environment Promote Women's IT Entrepreneurial Intention in Saudi Arabia? Technological and Institutional Perspectives*. Paper presented at the The Pacific Asia Conference on Information Systems.
- [2] Ali, B., Shah, N., & Anwar, S. (2019). Investigating entrepreneurial intention through entrepreneurial event model (EEM) among graduate and master students in public sector universities of Thailand. *Asia Pacific-Annual Research Journal of Far East & South East Asia*, 34.
- [3] Amabile, T. M. (1997). Entrepreneurial creativity through motivational synergy. *The Journal of Creative Behavior*, 31(1), 18-26.
- [4] Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological bulletin*, 103(3), 411.
- [5] Arbuckle, T. (2011). Studying software evolution using artefacts' shared information content. *Science of Computer Programming*, 76(12), 1078-1097.
- [6] Ardichvili, A., Cardozo, R., & Ray, S. (2003). A theory of entrepreneurial opportunity identification and development. *Journal of Business venturing*, 18(1), 105-123.
- [7] Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychological review*, 84(2), 191.
- [8] Bandura, A. (2000). Cultivate self-efficacy for personal and organizational effectiveness. *Handbook of principles of organization behavior*, 2, 0011-0021.
- [9] Bandura, A. (2014). Social cognitive theory of moral thought and action *Handbook of moral behavior and development* (pp. 69-128): Psychology Press.
- [10] Baojuan, Y., & Xiaoting, F. (2017). Entrepreneurial Environment on College Students' Entrepreneurial Intention: Moderated Mediating Effect. *Journal of Psychological Science*(6), 25.
- [11] Baron, R. A., & Tang, J. (2011). The role of entrepreneurs in firm-level innovation: Joint effects of positive affect, creativity, and environmental dynamism. *Journal of Business Venturing*, 26(1), 49-60.
- [12] Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of personality and social psychology*, 51(6), 1173.
- [13] Bateman, T. S., & Crant, J. M. (1993). The proactive component of organizational behavior: A measure and correlates. *Journal of organizational behavior*, 14(2), 103-118.
- [14] Biraglia, A., & Kadile, V. (2017). The role of entrepreneurial passion and creativity in developing entrepreneurial intentions: Insights from American homebrewers. *Journal of Small Business Management*, 55(1), 170-188.
- [15] Bogatyreva, K., Edelman, L. F., Manolova, T. S., Osiyevskyy, O., & Shirokova, G. (2019). When do entrepreneurial intentions lead to actions? The role of national culture. *Journal of Business Research*, 96, 309-321.
- [16] Boyd, N. G., & Vozikis, G. S. (1994). The influence of self-efficacy on the development of entrepreneurial intentions and actions. *Entrepreneurship theory and practice*, 18(4), 63-77.
- [17] Brenner, O. C., Pringle, C. D., & Greenhaus, J. H. (1991). Perceived fulfillment of organizational employment versus. *Journal of small business management*, 29(3), 62.
- [18] Campos, H. M. (2016). The role of creativity in mediating the relationship between entrepreneurial passion and entrepreneurial alertness. *Revista brasileira de gestão de negócios*, 18(61).
- [19] Chang, S.-J., Van Witteloostuijn, A., & Eden, L. (2010). From the editors: Common method variance in international business research: Springer.
- [20] Chen, C. C., Greene, P. G., & Crick, A. (1998). Does entrepreneurial self-efficacy distinguish entrepreneurs from managers? *Journal of business venturing*, 13(4), 295-316.
- [21] Chen, J. (2015). Do College Students' Entrepreneurship are Passive:A Discussion from the Perspective of Starting Salary. *Education and Economy*.
- [22] Ciuchta, M. P., & Finch, D. (2019). The mediating role of self-efficacy on entrepreneurial intentions: Exploring boundary conditions. *Journal of Business Venturing Insights*, 11, e00128.
- [23] Cohen, B., & Winn, M. I. (2007). Market imperfections, opportunity and sustainable entrepreneurship. *Journal of business venturing*, 22(1), 29-49.
- [24] Crant, J. M. (1995). The proactive personality scale and objective job performance among real estate agents. *Journal of applied*

- psychology, 80(4), 532.
- [25] Crijns, H., & Vermeulen, S. (2007). How entrepreneurial are our Flemish students?
- [26] Dacin, P. A., Dacin, M. T., & Matear, M. (2010). Social entrepreneurship: Why we don't need a new theory and how we move forward from here. *Academy of management perspectives*, 24(3), 37-57.
- [27] Dees, J. (2017). The meaning of social entrepreneurship,(2001 Revision).
- [28] Delle, E., & Amadu, I. M. (2016). Proactive personality and entrepreneurial intention: Employment status and student level as moderators. *Journal of Advance Management and Accounting Research*, 3(7), 69-81.
- [29] Elkington, J. (2001). The triple bottom line for 21st century business. *The Earthscan reader in business and sustainable development*, 20-43.
- [30] Fatoki, O. O. (2010). Graduate entrepreneurial intention in South Africa: Motivations and obstacles. *International journal of business and management*, 5(9), 87.
- [31] Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of marketing research*, 18(1), 39-50.
- [32] Forza, C. (2002). Survey research in operations management: a process-based perspective. *International journal of operations & production management*.
- [33] Frank, H., Lueger, M., & Korunka, C. (2007). The significance of personality in business start-up intentions, start-up realization and business success. *Entrepreneurship & Regional Development*, 19(3), 227-251.
- [34] Fuller, B., Liu, Y., Bajaba, S., Marler, L. E., & Pratt, J. (2018). Examining how the personality, self-efficacy, and anticipatory cognitions of potential entrepreneurs shape their entrepreneurial intentions. *Personality and Individual Differences*, 125, 120-125.
- [35] Fuller, J. B., Marler, L. E., & Hester, K. (2006). Promoting felt responsibility for constructive change and proactive behavior: Exploring aspects of an elaborated model of work design. *Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior*, 27(8), 1089-1120.
- [36] George, N. M., Parida, V., Lahti, T., & Wincent, J. (2016). A systematic literature review of entrepreneurial opportunity recognition: insights on influencing factors. *International Entrepreneurship and Management Journal*, 12(2), 309-350.
- [37] Gielnik, M. M., Frese, M., Graf, J. M., & Kampschulte, A. (2012). Creativity in the opportunity identification process and the moderating effect of diversity of information. *Journal of Business Venturing*, 27(5), 559-576.
- [38] Griffiths, M. D., Gundry, L. K., & Kickul, J. R. (2013). The socio-political, economic, and cultural determinants of social entrepreneurship activity: An empirical examination. *Journal of Small Business and Enterprise Development*, 20(2), 341-357.
- [39] Hair, J., Andreson, R., Tatham, R., & Black, W. (1998). Multivariate data analysis. 5th (ed) Prentice-Hall Inc. *Unites States of America*.
- [40] Hair, J. F., Sarstedt, M., Ringle, C. M., & Mena, J. A. (2012). An assessment of the use of partial least squares structural equation modeling in marketing research. *Journal of the academy of marketing science*, 40(3), 414-433.
- [41] Hansen, D. J., Shrader, R., & Monllor, J. (2011). Defragmenting definitions of entrepreneurial opportunity. *Journal of Small Business Management*, 49(2), 283-304.
- [42] Harman, H. H. (1976). Modern factor analysis University of Chicago Press. *Chicago, IL*.
- [43] Hatak, I., & Snellman, K. (2017). The influence of anticipated regret on business start-up behaviour. *International small business journal*, 35(3), 349-360.
- [44] Hechavarria, D. M., Terjesen, S. A., Ingram, A. E., Renko, M., Justo, R., & Elam, A. (2017). Taking care of business: the impact of culture and gender on entrepreneurs' blended value creation goals. *Small Business Economics*, 48(1), 225-257.
- [45] Hsu, D. K., Burmeister-Lamp, K., Simmons, S. A., Foo, M.-D., Hong, M. C., & Pipes, J. D. (2019). "I know I can, but I don't fit": Perceived fit, self-efficacy, and entrepreneurial intention. *Journal of Business Venturing*, 34(2), 311-326.
- [46] Hu, R., Wang, L., Zhang, W., & Bin, P. (2018). Creativity, proactive personality, and entrepreneurial intention: the role of entrepreneurial alertness. *Frontiers in psychology*, 9, 951.
- [47] Hu, R., & Ye, Y. (2017). Do entrepreneurial alertness and self-efficacy predict Chinese sports major students' entrepreneurial intention? *Social Behavior and Personality: an international journal*, 45(7), 1187-1196.
- [48] Hulland, J., Chow, Y. H., & Lam, S. (1996). Use of causal models in marketing research: A review. *International journal of research in*

- marketing, 13(2), 181-197.
- [49] Jackson, D. L., Gillaspay Jr, J. A., & Purc-Stephenson, R. (2009). Reporting practices in confirmatory factor analysis: an overview and some recommendations. *Psychological methods, 14*(1), 6.
- [50] Karimi, S., Biemans, H. J., Lans, T., Chizari, M., & Mulder, M. (2016). The impact of entrepreneurship education: A study of Iranian students' entrepreneurial intentions and opportunity identification. *Journal of Small Business Management, 54*(1), 187-209.
- [51] Kautonen, T., Van Gelderen, M., & Fink, M. (2015). Robustness of the theory of planned behavior in predicting entrepreneurial intentions and actions. *Entrepreneurship theory and practice, 39*(3), 655-674.
- [52] Kickul, J., & Gundry, L. (2002). Prospecting for strategic advantage: The proactive entrepreneurial personality and small firm innovation. *Journal of small business management, 40*(2), 85-97.
- [53] Kirzner, I. M. (2009). The alert and creative entrepreneur: A clarification. *Small Business Economics, 32*(2), 145-152.
- [54] Krueger Jr, N. F., Reilly, M. D., & Carsrud, A. L. (2000). Competing models of entrepreneurial intentions. *Journal of business venturing, 15*(5-6), 411-432.
- [55] Li, Y., Wang, P., & Liang, Y.-J. (2015). Influence of entrepreneurial experience, alertness, and prior knowledge on opportunity recognition. *Social Behavior and Personality: an international journal, 43*(9), 1575-1583.
- [56] Liñán, F., & Chen, Y. W. (2009). Development and cross-cultural application of a specific instrument to measure entrepreneurial intentions. *Entrepreneurship theory and practice, 33*(3), 593-617.
- [57] Liu, H.-C., Yin Ip, C., & Liang, C. (2018). A new runway for journalists: On the intentions of journalists to start social enterprises.
- [58] Lucas, W. A., & Cooper, S. Y. (2004). Enhancing self-efficacy to enable entrepreneurship: the case of CMI's connections.
- [59] Marler, L. E., Botero, I. C., & De Massis, A. V. (2017). Succession-related role transitions in family firms: The impact of proactive personality. *Journal of Managerial Issues, 29*(1), 57-81.
- [60] Marsh, H. W., & Hocevar, D. (1985). Application of confirmatory factor analysis to the study of self-concept: First-and higher order factor models and their invariance across groups. *Psychological bulletin, 97*(3), 562.
- [61] Martin, R. L., & Osberg, S. (2007). Social entrepreneurship: The case for definition: Stanford social innovation review Stanford.
- [62] Mauer, R., Neergaard, H., & Linstad, A. K. (2017). Self-efficacy: Conditioning the entrepreneurial mindset *Revisiting the entrepreneurial mind* (pp. 293-317): Springer
- [63] McGee, J. E., & Peterson, M. (2019). The long-term impact of entrepreneurial self-efficacy and entrepreneurial orientation on venture performance. *Journal of small business management, 57*(3), 720-737.
- [64] McMullen, J. S., & Shepherd, D. A. (2006). Entrepreneurial action and the role of uncertainty in the theory of the entrepreneur. *Academy of Management review, 31*(1), 132-152.
- [65] Miao, Q., & Liu, L. (2010). A psychological model of entrepreneurial decision making. *Social Behavior and Personality: an international journal, 38*(3), 357-363.
- [66] Muñoz, P. (2018). A cognitive map of sustainable decision-making in entrepreneurship. *International Journal of Entrepreneurial Behavior & Research.*
- [67] Neneh, B. N. (2019). From entrepreneurial alertness to entrepreneurial behavior: The role of trait competitiveness and proactive personality. *Personality and Individual Differences, 138*, 273-279.
- [68] Nunnally, J. C. (1978). *Psychometric theory*: McGraw-Hill.
- [69] Obschonka, M., Hakkarainen, K., Lonka, K., & Salmela-Aro, K. (2017). Entrepreneurship as a twenty-first century skill: entrepreneurial alertness and intention in the transition to adulthood. *Small Business Economics, 48*(3), 487-501.
- [70] Obschonka, M., Silbereisen, R. K., & Schmitt-Rodermund, E. (2010). Entrepreneurial intention as developmental outcome. *Journal of Vocational Behavior, 77*(1), 63-72.
- [71] Park, J. S. (2005). Opportunity recognition and product innovation in entrepreneurial hi-tech start-ups: a new perspective and supporting case study. *Technovation, 25*(7), 739-752.
- [72] Patzelt, H., & Shepherd, D. A. (2011). Recognizing opportunities for sustainable development. *Entrepreneurship Theory and Practice, 35*(4), 631-652.
- [73] Perry-Smith, J. E. (2006). Social yet creative: The role of social relationships in facilitating individual creativity. *Academy of Management*

- journal, 49(1), 85-101.
- [74] Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of applied psychology, 88*(5), 879.
- [75] Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior research methods, 40*(3), 879-891.
- [76] Santos, F. M. (2012). A positive theory of social entrepreneurship. *Journal of business ethics, 111*(3), 335-351.
- [77] Saraih, U., Aris, A. Z. Z., Mutalib, S. A., Ahmad, T. S. T., Abdullah, S., & Amlus, M. H. (2018). *The influence of self-efficacy on entrepreneurial intention among engineering students*. Paper presented at the MATEC Web of Conferences.
- [78] Sarasvathy, S. D., Dew, N., Velamuri, S. R., & Venkataraman, S. (2003). Three views of entrepreneurial opportunity *Handbook of entrepreneurship research* (pp. 141-160): Springer.
- [79] Schaltegger, S., Hansen, E. G., & Lüdeke-Freund, F. (2016). *Business models for sustainability: Origins, present research, and future avenues*: Sage Publications Sage CA: Los Angeles, CA.
- [80] Schaltegger, S., & Wagner, M. (2011). Sustainable entrepreneurship and sustainability innovation: categories and interactions. *Business strategy and the environment, 20*(4), 222-237.
- [81] Schreiber, J. B., Nora, A., Stage, F. K., Barlow, E. A., & King, J. (2006). Reporting structural equation modeling and confirmatory factor analysis results: A review. *The Journal of educational research, 99*(6), 323-338.
- [82] Sequeira, J. M. (2004). *The effect of network ties and entrepreneurial self-efficacy on immigrant new venture intentions*: The University of Texas at Arlington.
- [83] Shamsudeen, K., Keat, O. Y., & Hassan, H. (2017). Entrepreneurial success within the process of opportunity recognition and exploitation: An expansion of entrepreneurial opportunity recognition model. *International Review of Management and Marketing, 7*(1).
- [84] Shepherd, D. A., & Patzelt, H. (2011). The new field of sustainable entrepreneurship: Studying entrepreneurial action linking "what is to be sustained" with "what is to be developed". *Entrepreneurship Theory and Practice, 35*(1), 137-163.
- [85] Shinnar, R. S., Hsu, D. K., Powell, B. C., & Zhou, H. (2018). Entrepreneurial intentions and start-ups: Are women or men more likely to enact their intentions? *International Small Business Journal, 36*(1), 60-80.
- [86] Shook, C. L., Ketchen Jr, D. J., Hult, G. T. M., & Kacmar, K. M. (2004). An assessment of the use of structural equation modeling in strategic management research. *Strategic management journal, 25*(4), 397-404.
- [87] Short, J. C., Ketchen Jr, D. J., Shook, C. L., & Ireland, R. D. (2010). The concept of "opportunity" in entrepreneurship research: Past accomplishments and future challenges. *Journal of management, 36*(1), 40-65.
- [88] Steiger, J. H. (2007). Understanding the limitations of global fit assessment in structural equation modeling. *Personality and Individual differences, 42*(5), 893-898.
- [89] Stubbs, W. (2017). Sustainable entrepreneurship and B corps. *Business Strategy and the Environment, 26*(3), 331-344.
- [90] Tabachnick, B., & Fidell, L. (2007). *Using multivariate statistics*. Pearson Education, Upper Saddle River, NJ. *Using multivariate statistics*. Pearson Education, Upper Saddle River, NJ, -.
- [91] Tang, J. (2008). Environmental munificence for entrepreneurs: entrepreneurial alertness and commitment. *International Journal of Entrepreneurial Behavior & Research*.
- [92] Tang, J., Kacmar, K. M. M., & Busenitz, L. (2012). Entrepreneurial alertness in the pursuit of new opportunities. *Journal of business venturing, 27*(1), 77-94.
- [93] Tushman, M. L., & Anderson, P. (1986). Technological discontinuities and organizational environments. *Administrative science quarterly, 439-465*.
- [94] Utami, C. W. (2017). Attitude, subjective norm, perceived behaviour, entrepreneurship education and self efficacy toward entrepreneurial intention university student in Indonesia.
- [95] Venkataraman, S. (2019). The distinctive domain of entrepreneurship research *Seminal ideas for the next twenty-five years of advances*: Emerald Publishing Limited.
- [96] Vuorio, A. M., Puumalainen, K., & Fellhofer, K. (2018). Drivers of entrepreneurial intentions in sustainable entrepreneurship. *International Journal of Entrepreneurial Behavior & Research*.

- [97] Ward, T. B. (2004). Cognition, creativity, and entrepreneurship. *Journal of business venturing*, 19(2), 173-188.
- [98] Wen-pei, C. (2016). Relationship network and entrepreneurial opportunity identification: The multiple mediating effects of entrepreneurial learning. *Studies in Science of Science*(9), 13.
- [99] Wilson, F., Kickul, J., & Marlino, D. (2007). Gender, entrepreneurial self-efficacy, and entrepreneurial career intentions: Implications for entrepreneurship education. *Entrepreneurship theory and practice*, 31(3), 387-406.
- [100] Yan, X., Gu, D., Liang, C., Zhao, S., & Lu, W. (2018). Fostering sustainable entrepreneurs: Evidence from China college students' "Internet Plus" innovation and entrepreneurship competition (CSIPC). *Sustainability*, 10(9), 3335.
- [101] Young, W., & Tilley, F. (2006). Can businesses move beyond efficiency? The shift toward effectiveness and equity in the corporate sustainability debate. *Business Strategy and the Environment*, 15(6), 402-415.
- [102] Yu, T. F.-L. (2001). Entrepreneurial alertness and discovery. *The review of Austrian economics*, 14(1), 47-63.
- [103] Zampetakis, L. A. (2008). The role of creativity and proactivity on perceived entrepreneurial desirability. *Thinking Skills and Creativity*, 3(2), 154-162.

## Tables and Figures

### Tables

Table 1. Scale development.

Constructs	Items	Source
Entrepreneurial self-efficacy	I can pick out the ability cost of a concept It is a pleasure to cooperate with others Being able to solve problems I have effective decisions making I can effectively convince people who have unique thoughts	(Lucas & Cooper, 2004)
Proactive personality	I enjoy facing and overcoming obstacles to my idea. Nothing is more exciting than seeing my idea turn in to reality I excel to identify opportunity I can spot a good opportunity long before others can	(Bateman & Crant, 1993; Kickul & Gundry, 2002)
Creativity	New thoughts or approaches to solving problems or wishes Use of existing technology in new application Always taking risk Absolute innovative ideas; A new vision with long-term impacts.	(R. A. Baron & Tang, 2011; Perry-Smith, 2006)
Entrepreneurial Alertness	I will improve latest career ideas by social circle. I will acquire new enterprise facts by using collaborating within the seminar. I can always see the advice of different people. I can locate functional facts that more people not observed The surface of independent facts from I can see capacity dating covered I actually have a talent for recognizing ability commercial enterprise chances	(Miao & Liu, 2010)
Opportunity Recognition	I recognition the entrepreneurial opportunities are especial. I have found that sustainable business opportunities can be socially recognized through sustainable products and services The services or products I actually have recognized aren't widely to be had in the market. The service or product provided by an entrepreneurial opportunity and higher social advantages are sustainable A sustainable products or services furnished by way of an entrepreneurial possibility can offer development	(George et al., 2016)
Sustainably Entrepreneurial Intention	I will start a company that further focused on social and environmental problems as compare to new upcoming business opportunities I actually have the possibility and liberty to come to a conclusion, I will establish a commercial enterprise that put up to propensity in our society to social, ecological, and economic goals. I will yet select to begin my personal enterprise on eco-products when I come across realistic problems. Differentiate with having a solid task, I am extra inclined to begin an enterprise on sustainable improvements. Beginning of social entrepreneurship, the next coming five years I imagen actually have the opportunity	(Brenner et al., 1991)



Table 2. Descriptive statistics (values, percent)

variables	Frequency	Percentage
Age		
20-25	148	15.1%
26-30	266	27.2%
31-35	60	6.1%
36-40	26	2.7%
Gender		
Male	385	39.4%
Female	115	11.8%
Degree level		
Masters	275	28.1%
Bachelor	195	20.0%
Others	30	3.1%
Facility discipline		
Engineering	263	26.9%
Business	205	21.0%
Others	32	3.3%
Entrepreneurship Education		
YES	318	32.5%
NO	182	18.6%
Parental Entrepreneurial Exposure		
YES	90	9.2%
NO	410	42.0%
Prior Entrepreneurial knowledge		
YES	82	8.4%%
NO	418	42.8%

Table 3. Total variance explained (Harman's single factor test)

Component	Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	6.261	20.195%	20.195%

Table 4. Analysis of Measurement Accuracy

Factor	Item	FL (>0.7)	Cronbach's Alpha Coefficient (Alpha > 0.7)	Composite Reliability Coefficient (CR > 0.7)	Average Variance Extracted (AVE > 0.5)	variance inflation factors (VIF<5)
ESE	ESE1	0.908	0.940	0.952	0.768	1.384
	ESE2	0.895				
	ESE3	0.892				
	ESE4	0.888				
	ESE5	0.844				
	ESE6	0.831				
PP	PP1	0.814	0.795	0.867	0.620	2.039
	PP2	0.791				
	PP3	0.781				
	PP4	0.763				
CR	CR1	0.798	0.872	0.907	0.662	1.087
	CR2	0.828				
	CR3	0.860				
	CR4	0.793				
	CR5	0.787				
EA	EA1	0.741	0.808	0.903	0.610	1.070
	EA2	0.775				
	EA3	0.792				
	EA4	0.812				
	EA5	0.803				
	EA6	0.760				
OR	OR1	0.798	0.810	0.907	0.662	2.339
	OR2	0.828				
	OR3	0.860				
	OR4	0.793				
	OR5	0.787				
SEI	SEI1	0.828	0.900	0.925	0.678	1.294
	SEI2	0.828				
	SEI3	0.827				
	SEI4	0.822				
	SEI5	0.818				
	SEI6	0.784				

Table 5. Descriptive Statistic, Correlation and Discriminant validity of Constructs

Constructs	Mean	SD	Gender	Age	ESE	PP	AL	OR	CR	SEI
Gender <sup>1</sup>	1.2300	.42125								
Age <sup>1</sup>	1.9300	.79395	0.335**							
ESE	3.7957	1.02825	-0.121	0.073	<b>0.876.</b>					
PP	3.9730	0.83811	-0.087*	0.334	0.541**	<b>0.787</b>				
AL	3.8800	0.82500	-0.038	0.022	0.660**	0.433**	<b>0.781</b>			
OP	3.8560	0.88346	0.424**	0.160	0.700**	0.208**	0.355	<b>0.813</b>		
CR	3.9045	0.91730	-0.200*	0.142	0.234	0.023	0.227	0.342**	<b>0.813</b>	
SEI	3.6337	0.98867	-0.097	0.055	-0.011*	-0.258	0.083*	0.029**	0.565*	<b>0.823</b>

Note: Diagonal values in bold represent the square root of the AVE values. Between the constructs and their measures. Off-diagonal elements are correlations between constructs. AVE= Average Variance Extracted.  $\square < 0.05$   $\square < 0.01$ ,  $\square < 0.001$ , 1= control variable

Table 6. Measures of the model fit structural model

Fit Indices	Criteria	Indicators	Sources
Chi -square	p > 0.050	4481.482 (p <0.001)	(J. F. Hair, Sarstedt, Ringle, & Mena, 2012)
Chi-square/ df (degree of freedom)	<5.000	1.662 (4481.482/2696)	
(GFI) Good of fit index	>0.900	0.931	
(AGFI) adjusted good fit index	>0.900	0.902	
(RFI) relative fit index	>0.900	0.946	
(NFI) normed fit index	>0.900	0.950	
(CFI) comparative fit index	>0.950	0.901	
(RMSEA) root mean square error approximation	<0.080	0.054	
(RMR) root mean square residual	<0.050	0.036	

Table 7. The direct and indirect result of the study

Direct Effect					Indirect Effect			
Path	Point estimation	S. E	z. value	p	Path	Point Estimate	2000 times 95% CI Bias-corrected percentile	
							BootLLCI	BootULCI
ESE→SEI	0.382	0.089	4.265	0.001				
ESE→OR	0.071	0.026	2.730	0.05	ESE→AL→OR	0.06	0.02	0.09
ESE→EA	0.077	0.019	4.16	0.01	ESE→AL→SEI	0.05	0.01	0.13
CR→EA	0.270	0.052	5.192	0.001	CR→AL→OR	-0.13	-0.21	-0.05
PP→EA	0.168	0.049	3.456	0.001	CR→AL→SEI	0.06	0.01	0.13
PP→SEI	0.031	0.010	3.204	0.001	PP→AL→OR	0.14	0.7	0.23
EA→OR	0.163	0.058	2.812	0.05	PP→AL→SEI	-0.09	-0.16	-0.62
EA→SEI	0.251	0.056	4.480	0.001				
OR→SEI	0.191	0.077	2.490	0.013				
Age <sup>1</sup>	0.119**							
Gender <sup>1</sup>	0.113***							

Note: ESE= Entrepreneurial Self efficacy. PP = proactive personality. EA = Entrepreneurial alertness. OP= opportunity recognition. CR = creativity. SEI = sustainable entrepreneurial intention. Point estimation = Standardized coefficient, SE = Standard error, Z = Z value, P= p value CI = Confidence interval, Boot LLCI= Boot lower limit confidence, Boot ULCI = Boot upper confidence interval, 1= control variable

Figures

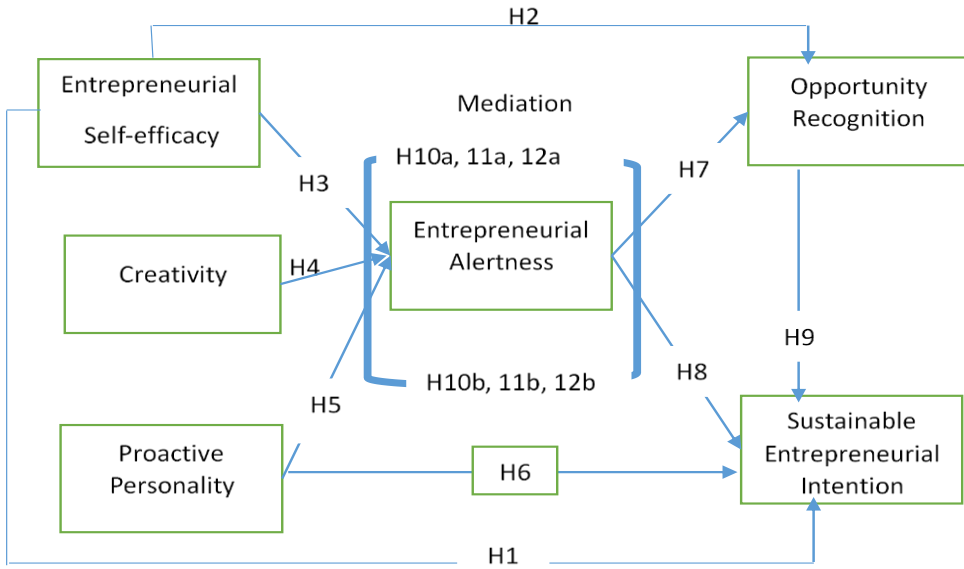


Figure 1.

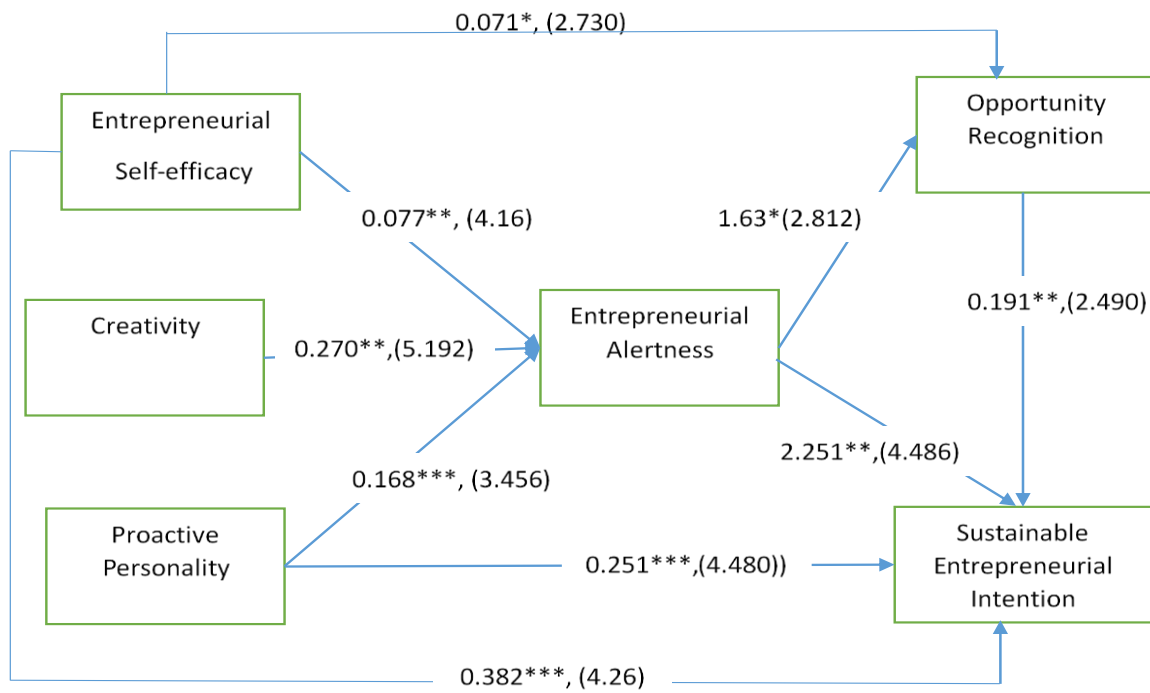


Figure 2. Summary of the results. Note. \* P < 0.05, \*\* p 0.01, \*\*\* p 0.001