DOI: 10.28934/jwee24.12.pp19-39
JEL: L26, 031, J20, 010, J23

ORIGINAL SCIENTIFIC PAPER

Entrepreneurial Attitude and Entrepreneurial Intentions of Female Engineering Students: Mediating Roles of Passion and Creativity

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A B S T R A C T

Entrepreneurship holds a crucial function in addressing societal and economic issues like joblessness and inequalities between different regions. Acknowledging its significance, government officials and educational institutions exert considerable energy towards nurturing individuals into entrepreneurs. Multiple elements influence a person's path to becoming an entrepreneur. This research seeks to examine how one's entrepreneurial attitude (EA) impacts one's drive to become an entrepreneur, with passion and creativity serving as an intermediary in this connection. The research is explanatory and employs a survey-based approach. The findings convey that entrepreneurial attitude significantly influences the determination of female engineering students to pursue entrepreneurship. The study highlights the mediating roles of passion and creativity in the relationship between entrepreneurial attitude and intentions. While passion positively mediated the relationship, creativity had a negative mediating effect.

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KEYWORDS: *entrepreneurship, engineering, economic development, innovation, employment*

Introduction

Entrepreneurship entails deliberate and purposeful actions, emphasizing that the initiation of a business is a result of conscious intent. The drive to be entrepreneurial can serve as a reliable indicator of how someone is likely to approach the process of building a new venture. Entrepreneurship's significance is recognized across developed and developing nations due to its bolstering a country's economic well-being (Jiatong et al., 2021). Entrepreneurial initiatives generate employment opportunities and growth (Anjum et al., 2022; Bignetti et al., 2021; Rita Amelinda, 2019). The inclination to be an entrepreneur is known as entrepreneurial intention (EI). A mental state that propels individuals towards initiating new business ventures is EI (Biraglia & Kadile, 2017a). EIs are shaped by many factors (Anjum et al., 2022). Numerous research works have demonstrated the influence of entrepreneurial education on shaping EIs (Jiatong et al., 2021; Setia & Nuringsih, 2022). Apart from entrepreneurial education, intrinsic features, including inspiration, efficiency, passion, mindset, attitude, altruism, vigilance, and creativity, substantially contribute to an individual's entrepreneurial intentions. Additionally, external factors like family support, institutional backing, and governmental assistance play pivotal roles in influencing individuals' EIs. "The Theory of Planned Behaviour" (TPB), put forth by Ajzen in 1991, underscores the relationship between "attitude, intention, and subsequent behavior." According to the TPB, a person's attitude influences their intention, which in turn shapes their actions. In the context of entrepreneurship, an individual's attitude toward this field significantly influences their intentions to engage in entrepreneurial activities. Individuals who are passionate about entrepreneurial activities have more possibility of becoming entrepreneurs on their own (Murad et al., 2021). Consequently, entrepreneurial passion appears to wield a considerable impact on an individual's entrepreneurial intentions.

Engineering students 'attitude' is known to have a greater impact on EI (Law & Breznik, 2017). To a large extent, the perception of behavioral control influences the gender impact on EI. Women's attitudes, subjective standards, perceived behavioral control, and their relationship with entrepreneurial goals ought to be targeted by the policymakers to boost female start-ups. Irrespective of the increased interest in the study of 'female

entrepreneurship,' there is a lacuna in the link between the person's gender and their entrepreneurial goals (Yordanova & Tarrazon, 2010). Gender disparity in students' EI highlighted that male students were more likely to be entrepreneurial than female students (Gure, 2017). Gerba (2012) argued that female engineering students tend to have an inclination towards entrepreneurial careers, subjective norms, and a need for achievement. EA had a significant impact on the EI of female students, while creativity had a lesser impact in influencing them to choose entrepreneurship (Law & Breznik, 2017). Passion plays a significant motivational role in human behavior (Thuy et al., 2020). Previous research works did not focus on the possibility of entrepreneurial passion (EP) serving as a mediator in the connection between EA and EIs. As a result, one of the objectives of this study has been to investigate the mediating role of entrepreneurial passion in the relationship between EA and EI (Ediagbonya, 2023). Creativity holds paramount importance for entrepreneurs, as it constitutes a vital element within the realm of entrepreneurship (Dali et al., 2021). The capacity to discern valuable opportunities amidst uncertainty and subsequently translate them into innovations within the market ultimately results in the realization of entrepreneurial profits upon reflection (Wach & Bilan, 2023). Creativity, which provides feasible and creative solutions to prevailing glitches, takes on a pivotal role in entrepreneurship, involving the development of novel business solutions (Bignetti et al., 2021). Within this context, individuals who harbor a greater entrepreneurial passion tend to exhibit heightened creativity in pursuit of their goals (Murad et al., 2021).

Women are primarily known for their role as mothers, sisters, or daughters and are restricted to see themselves as dominant, independent, and task-oriented, which are vital for choosing entrepreneurship as a career option (Chasserio et al., 2014). Vivid social identities block women entrepreneurs from perceiving themselves negatively in becoming successful entrepreneurs (Swail & Marlow, 2018). As per the research conducted by Filter (2020), gender identity does not stimulate passion, and thus, men and women experience similar passion towards becoming an entrepreneur. In light of these premises, the current study endeavors to assess the influence of EA on EIs, focusing on the mediating effects of passion and creativity. The study focuses on female engineering students, addressing the underrepresentation of women in entrepreneurship, particularly in Science, Technology, Engineering, and Mathematics (STEM) related fields. Understanding female students' entrepreneurial attitudes and intentions is crucial for promoting gender diversity in entrepreneurship. The

research is conducted within the context of engineering education. This is important as it explores the link between academic disciplines (engineering) and entrepreneurial attitudes. Insights from this study can inform educational institutions on how to foster an entrepreneurial mindset among female engineering students.

Analyzing entrepreneurial attitudes is essential for identifying the predisposition of individuals toward entrepreneurship. This information can be valuable for designing interventions and educational programs to cultivate a positive entrepreneurial mindset among female engineering students. Understanding the intentions of female engineering students to pursue entrepreneurship provides insights into the potential future landscape of entrepreneurship. Identifying factors influencing these intentions is critical for developing targeted strategies to support and encourage female students in their entrepreneurial endeavors. Including passion and creativity as mediating factors adds depth to the study. Investigating how these factors mediate the relationship between entrepreneurial attitude and intentions can provide nuanced insights. The findings of this research can have implications for policy development. Policymakers can use the insights to tailor policies that specifically address the needs and challenges faced by female engineering students aspiring to become entrepreneurs. This may include targeted support programs, mentorship initiatives, or curriculum adjustments. The study contributes to the existing body of knowledge on entrepreneurship, particularly in the context of female representation in STEM fields. It adds empirical evidence and insights into the factors influencing entrepreneurial attitudes and intentions, which can be valuable for researchers, educators, and policymakers in the field.

This research consists of five main sections. The first section deals with the review of existing relevant research works relating to entrepreneurial attitude, entrepreneurial intentions, women entrepreneurship, passion, and creativity. Further, this section presents the hypotheses that are developed. The second section presents the research design, methodology, and data employed in this study. The third section exhibits a detailed analysis of the data and their results. Discussions of the study results are presented in the fourth section. The fifth section presents the conclusions derived from the results of the study.

Literature Review and Hypothesis Development

The undeniable contribution of entrepreneurship to a nation's economic progress is well-established. Entrepreneurs, through their adeptness at profit generation, poverty reduction, and job creation, serve as catalysts for a country's economic growth and prosperity (Anjum et al., 2021). Entrepreneurs who possess adaptability and forward-thinking capabilities play a pivotal role in enhancing their country's economic performance. Given the prominent role that entrepreneurship plays in fostering a nation's economic development, it becomes imperative for the government to actively encourage young individuals to engage in entrepreneurial pursuits (Jiatong et al., 2021). With increased participation in entrepreneurial activities, especially among youth, the potential for establishing more job-creating business ventures is significantly heightened (Dali et al., 2021). Entrepreneurship represents a career path chosen by select individuals (Nguyen et al., 2022), as it demands specific and notable attributes encompassing internal, external, contextual, and personal factors. Notably, not everyone embarks on the journey of entrepreneurship. Critical to this pursuit is entrepreneurial education, which exhibits a positive correlation with individuals' intentions to engage in entrepreneurial endeavors (Boahemaah et al., 2020; Al Ghafri & Malik, 2021; Hattab, 2014 and Fadli et al., 2020). Characterized as an individual's entrepreneurial aspirations, EI plays a pivotal role in steering entrepreneurial activities (Al Ghafri & Malik, 2021). EIs are significantly influenced by an individual's attitude, as posited by Ajzen in 1991. In view of research conducted on engineering students in Hong Kong, the findings showed that whereas entrepreneurship positively increased EA and EI, female students had lower EI than male students. The report recommends implementing fresh approaches to education in order to foster the growth of female entrepreneurs (Choitung et al., 2012). Intention is an innate sense of preference and interest in something or an activity without external influence. Interest signifies the acknowledgment of a connection between oneself and an external entity. Intentions are instances and inclinations that strongly align with a perceived necessity (Radiman et al., 2021). Entrepreneurial intentions are the initial stage in establishing a typically long-term commercial venture (Radiman et al., 2021). In essence, an entrepreneurial attitude captures an individual's cognitive and emotional disposition towards the realm of entrepreneurship (Amofah & Saladrigues, 2022).

Crucially, entrepreneurial passion stands as a distinctive trait inherent to every entrepreneur (Biraglia & Kadile, 2017a). This form of passion signifies an intense and positive sentiment directed at entrepreneurial pursuits (Cardon & Kirk, 2015). Entrepreneurial passion serves as a motivational force driving engagement in entrepreneurial endeavors (Murad et al., 2021). Passion is significant when the entrepreneurial ecosystem is less positive (Cardon et al., 2009). The data gathered from female undergraduate students highlighted the favorable relationship between entrepreneurial self-assessment and EI, underscoring the significance of cultivating an entrepreneurial mentality to foster entrepreneurial passion and intention (Manjaly et al., 2022). Notably, EP holds a positive influence on EIs (Moses et al., 2016). Creativity, on the other hand, pertains to the generation of novel and viable concepts (Biraglia & Kadile, 2017a). This creative capacity is integral to entrepreneurial intent (Biraglia & Kadile, 2017a). Moreover, EP acts as an enhancer of creativity (Murad et al., 2021). Entrepreneurs surmount obstacles, persevere through failures, and utilize Entrepreneurial Passion (EP) as a driving force. EP serves as a source of motivation and a means of turning their concepts into tangible realities (Saboor et al., 2020). Entrepreneurial passion plays a pivotal role as a motivating force and a key factor in fostering entrepreneurial intentions (Oktavio et al., 2023). Passion is intricately linked to the concept of identity in the pursuit of entrepreneurial objectives. Individuals with a strong passion are also more inclined to express interest in initiating their businesses (Ferreira-Neto et al., 2023).

Creativity holds special significance in the realm of entrepreneurship, where entrepreneurship itself can be viewed as an inherently creative endeavor. Within the context of entrepreneurship from a cognitive perspective, there is a crucial emphasis on the cognitive elements that enable individuals to perceive and capitalize on opportunities when embarking on new business ventures. This perspective emphasizes creativity that allows individuals to generate innovative ideas and fosters the development of entrepreneurial intentions (EI). Entrepreneurial creativity stands out as a fundamental component of entrepreneurship because individuals must possess creativity to effectively identify and seize opportunities in the entrepreneurial landscape (Ediagbonya, 2023). Creativity translates fresh, ingenious, and imaginative ideas into reality, demanding both enthusiasm and unwavering dedication (Dali et al., 2021). Individuals with creative prowess not only derive personal satisfaction but also tend to excel in various aspects of their lives, cultivating positive relationships with

colleagues, customers, and even family members. Such individuals readily extend their cooperation to support entrepreneurs in activities like information gathering and resource sharing, indirectly contributing to the expansion of entrepreneurs' market presence and profitability (Nguyen et al., 2021). Creative individuals can also bolster their self-esteem and self-confidence through their entrepreneurial activities, powered by a sense of accomplishment that drives success in their business ventures (Waele, 2020). Despite numerous prior studies predominantly emphasizing that entrepreneurial passion or one's attitude toward entrepreneurship serves as the primary predictor of entrepreneurial intention, there remains a gap in the cause-and-effect relationship between creativity and EIs (Wathanakom et al., 2020).

The extant research works demonstrate the interconnectedness of EIs, attitude, passion, and creativity. Although numerous studies have explored these variables within the entrepreneurial context, there remains a dearth of research, particularly in the Indian context, concerning the role of attitude, passion, and creativity in shaping individuals' EIs. The present research work endeavors to address this research gap. Specifically, it seeks to analyze the impact of EA on the EIs of female engineering students in India, keeping passion and creativity as mediators. In alignment with the study's objectives, hypotheses are framed, and Figure 1 depicts the research model.

Hypothesis 1*: The EA of engineering students has a significant impact on their EI.*

Hypothesis 2: *Passion serves as a significant mediator in the relationship between EA and EI.*

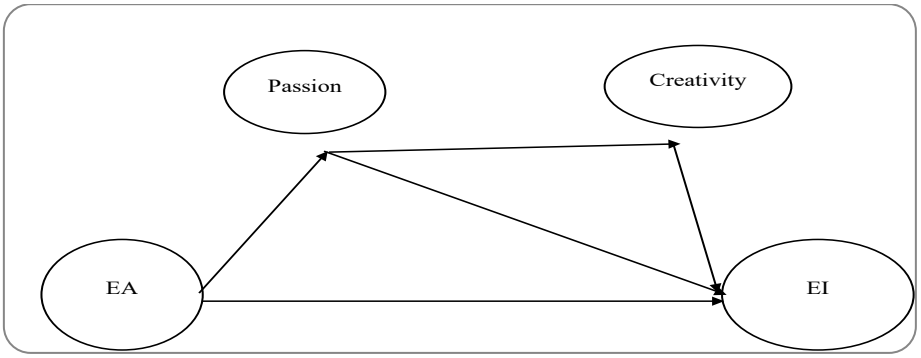
Hypothesis 3: *Creativity plays a significant mediator in the relationship between EA and EI.*

Hypothesis 4: *Passion and Creativity jointly have a mediating role in the relationship between EA and EI.*

Here, the impact of EA of engineering students on EIs is measured through the validated scales and analyzed using regression analysis. The mediation role of passion between EA and EIs was analyzed using the mediation analysis of Hayes' PROCESS model 4. The mediation role of creativity between EA and EIs is analyzed using the mediation analysis of Hayes' PROCESS model 4. Finally, the joint mediation roles of passion and creativity between EA and EIs are analyzed using the mediation analysis of Hayes' PROCESS model 6 (Hayes, 2012). Further, the study focuses on the

research design in view of the identified hypothesis to fulfill the objectives of the undertaken study.

Figure 1: Proposed research model



Source: Authors own source

Research Methodology and Data

Research Design

This study employs a descriptive research design to investigate the relationships among EA, EP, creativity, and EIs. Descriptive research focuses on describing the characteristics or behaviors of female engineering students on EA, EP, creativity, and EIs. This research is conducted as a "cross-sectional study". A cross-sectional study is a type of observational research design that collects data from participants at a single point in time. Unlike longitudinal studies, which involve data collection over an extended period, cross-sectional studies provide a snapshot of a population at a specific moment.

Sample Design

The population under study comprises female engineering students across India, and the target population is "female engineering students in Bangalore." This selection is made due to practical considerations related to feasibility and cost-effectiveness. Bangalore has been chosen for its status as a prominent hub for start-ups and its concentration of higher education institutions. With more than 500,000 engineering students enrolled in various programs in Bangalore, it provides a suitable context for the

research. Considering that the population size falls between 75,000 and 1,000,000, the optimal sample size determined using a 95% level of significance is 382, according to Krejcie and Morgon's (1970) guidelines. Hence, the study's sample size is set at 382. In terms of the sampling technique, a judgment sampling approach is employed. This method involves selecting participants based on the judgment of their relevance to the objectives and criteria of the study.

Data and Methods

This study employs a survey method where primary data was collected from a sample of individuals through questionnaires or interviews. The primary data for this study is gathered from female engineering students, who constitute the study participants, through the administration of a structured questionnaire. The research instrument has two sections. “Section A” deals with capturing the personal characteristics of the respondents, while “Section B” is designed to gauge the central variables, including entrepreneurial attitude, passion, creativity, and entrepreneurial intentions. Established and validated scales are employed to measure these variables. The study operationalizes its constructs EA, EP, creativity, and EIs through the utilization of established measurement scales. Entrepreneurial attitude is measured by a scale developed by Fayolle & Gailly (2015). Entrepreneurial passion is quantified using the scale of Cardon et al. (2013). The creativity scale developed and validated by Biraglia & Kadile (2017) is employed in this study. Further, the scale of Liñán et al. (2011) is applied to measure the EI of female engineering students. The table consisting of the data sources is presented in Appendix (Table – 1A).

Preliminary Study

A pilot study has been conducted to assess the consistency of the measurement scales. In this preliminary phase, 55 responses were gathered from engineering students in Bangalore. The Cronbach's α scores for the variables, namely EA, EP, creativity and EIs, are 0.741, 0.862, 0.765, and 0.758, respectively. These α scores are acceptable, indicating good internal consistency and reliability of the measurement scales. With the confirmation of reliable measurement scales, the main study is subsequently undertaken.

Results and Analysis

The normality of constructs such as EA, EP, creativity, and EIs was evaluated through normality tests. The results of these tests indicated that these variables are not normally distributed. Regarding the demographic composition, the sample units were female students, where 57% of the respondents were between the ages of 17 and 24 years. Furthermore, 95.7% of the sampled engineering institutions were privately owned and situated in urban areas. An exploration of differences in perceptions regarding EA, EP, creativity, and EI was conducted. Non-parametric mean difference analyses were performed. The outcomes of these analyses suggest that EA, EP, and creativity among the surveyed respondents remain consistent across various individual features such as "gender, age, the branch of engineering study, and the type of engineering institution attended". No significant variation was observed in entrepreneurial intentions based on "age, the branch of engineering study, and type of engineering institution".

The mediating role of passion in the relationship between EA and EIs was checked using the PROCESS model 4 of Hayes (Hayes, 2012).

Table 1: Information on the model

Outcome Variable: Passion				
Correlation	regression	MSE	F-value	P-value
0.1325	0.1175	0.4097	5.8921	0.009

Source: Authors own source

Table 1 reveals that the overall model is significant (p-value: 0.009). This suggests that the relationships among the variables under examination are collectively meaningful. Moreover, according to Table 2, EA significantly impacts the level of passion exhibited by the sampled students. This indicates that the attitudes these students hold towards entrepreneurship have a noteworthy influence on the extent of their passion for entrepreneurial activities.

Table 2: Model

Outcome Variable: Passion				
Particulars	Coefficients	Standard Error	t-value	P-value
Constant	3.4155	0.3846	14.7149	0.000
EA	0.1279	0.0489	3.5961	0.009

Source: Authors own source

The mediating effect of students' passion is illustrated in Tables 3 and 4. The mediation model is significant (Table 3). It conveys that the mediation process involving EA and passion is meaningful and contributes to the understanding of the relationships under study.

Table 3: Information on the model

Outcome Variable: Entrepreneurial Intentions				
Correlation	Regression	MSE	F-value	P-value
0.6523	0.5961	0.1328	5273.4368	0.000

Source: Authors own source

The influence of EA and EP on the EIs of the sample units is detailed in Table 4. The results reveal that both EA and EP exert a significant impact on EIs. This implies that both of these factors occupy a substantial part in shaping the EIs of the students. The significance of the indirect effects from EA to EP (as demonstrated in Table 2) and from EP to EIs (as presented in Table 3) highlights the mediating role of EP in connecting EA with EIs. This further underscores the importance of passion as a mechanism through which entrepreneurial attitude affects EIs.

Table 4: Model

Outcome Variable: Entrepreneurial Intentions				
Particulars	Coefficients	Standard Error	t-value	P-value
Constant	0.5988	0.1693	3.6892	0.000
EA	0.8134	0.0438	22.5438	0.000
Passion	0.7091	0.0455	12.7281	0.000

Source: Authors own source

The analysis presented in Table 5 demonstrates that EA has a significant impact on the EIs of the students, accounting for 81.3% of the

variance. This outcome supports the first hypothesis, confirming that there is indeed a substantial and meaningful connection between EA and EIs among the student participants.

Table 5: Direct effect

Effect	Standard Error	t-value	P-value
0.8134	0.0438	22.5438	0.000

Source: Computed

The findings from Table 6 indicate that the total indirect effect of EP in EA and EI relation is 24.9%, and this effect is statistically significant. This supports the second hypothesis, providing evidence that passion indeed mediates the link between EA and EIs.

Table 6: Indirect effect

Mediator	Effect	Boot SE	Boot LLCI	BootULCI
Passion	0.2459	0.03897	0.2157	0.3128

Source: Computed

The results presented in Tables 1 to 6 collectively reveal that EA significantly influences EIs, and EP significantly mediates EA and EIs relation of the sampled students. The mediating role of creativity in EA and EIs relation of the sampled students was investigated by applying Hayes' PROCESS model 4 (Hayes, 2012).

Table 7: Information on the model

Outcome Variable: Creativity				
Correlation	regression	MSE	F-value	P-value
0.6905	0.4765	0.2130	346.269	0.000

Source: Authors own source

Tables 7 and 8 provide valuable insights into the analysis outcomes. Table 7 highlights the statistical significance of the overall model, signifying that the interconnections among the variables being studied collectively hold meaning. Meanwhile, Table 8 demonstrates a substantial correlation between entrepreneurial attitude and the level of creativity displayed by the surveyed students. This underscores the significance of

these students' entrepreneurial attitudes in shaping the extent of their creativity when engaging in entrepreneurial pursuits.

Table 8: Model

Outcome Variable: Creativity				
Particulars	Coefficients	Standard Error	t-value	P-value
Constant	1.0881	0.1564	6.9552	0.000
EA	0.7073	0.0380	18.608	0.000

Source: Authors own source

Table 9 and 10 depict the mediating role of students' creativity. Table 9 confirms the significance of the mediation model, indicating that the process of mediation involving entrepreneurial attitude and creativity holds significance and enhances our comprehension of the relationships being examined.

Table 9: Information on the model

Outcome Variable: Creativity				
Correlation	regression	MSE	F-value	P-value
0.7834	0.6136	0.1579	300.9800	0.000

Source: Authors own source

Table 10 provides a comprehensive account of how entrepreneurial attitude and creativity influence the EIs of the sample units. The results indicate that both entrepreneurial attitude and creativity wield significant influence over entrepreneurial intentions. This implies that these two factors substantially contribute to shaping the students' intentions to engage in entrepreneurial pursuits.

Furthermore, the noteworthy indirect effects observed in Table 8, from entrepreneurial attitude to creativity, and in Table 9, from creativity to entrepreneurial intentions, underscore the mediating function of creativity in bridging the gap between EA and EIs. This further emphasizes the critical role of creativity through which entrepreneurial attitude impacts EIs.

Table 10: Model

Outcome Variable: Entrepreneurial Intentions				
Particulars	Coefficients	Standard Error	t-value	P-value
Constant	0.8587	0.1430	6.0041	0.000
EA	0.9183	0.0452	20.2968	0.000
Creativity	-0.1786	0.0442	-4.0443	0.000

Source: Authors own source

The data presented in Table 11 showcases that EA significantly influences the EIs of the students, explaining 91.83% of the variance. This result validates the first hypothesis, providing strong evidence for the existence of a substantial and meaningful connection between EA and EIs of the student participants.

Table 11: Direct effect

Effect	Standard Error	t-value	P-value
0.9183	0.0452	20.2968	0.000

Source: Computed

The results presented in Table 12 reveal that the overall indirect impact of creativity in the connection between EA and EIs amounts to -12.63%, and this impact is statistically significant, albeit in a negative direction. This lends support to the third hypothesis, offering evidence that creativity does act as a mediator in the relationship between entrepreneurial attitude and entrepreneurial intentions.

Table 12: Indirect effect

Mediator	Effect	Boot SE	Boot LLCI	BootULCI
Creativity	-0.1263	0.0298	-0.1861	-0.0690

Source: Computed

The findings from Tables 7 to 12, taken together, demonstrate that entrepreneurial attitude indeed exerts a significant influence on entrepreneurial intentions, and creativity effectively serves as a significant mediator in the EA and EIs relation of the surveyed students.

From the above results, one can understand that EP significantly and positively mediates the EA and EIs relation of the sample units. However,

the prime relationship is better than the mediating relationship of passion. On the other hand, creativity significantly and negatively mediates the EA and EIs relation of the sample units. The prime relationship is better than the mediating relationship of creativity. This study also hypothesized that passion and creativity jointly have a mediating role in EA and EIs relations. This investigation was conducted using the PROCESS model 6 developed by Hayes (Hayes, 2012). Tables 13 and 14 depict the mediating roles of passion and creativity. Table 13 confirms the significance of the mediation model, indicating that the process of mediation involving entrepreneurial attitude and creativity holds significance and enhances our comprehension of the relationships being examined.

Table 13: Information on the model

Outcome Variable: Entrepreneurial Intentions				
Correlation	regression	MSE	F-value	P-value
0.7843	0.6151	0.1577	201.3654	0.000

Source: Authors own source

Table 14 provides a comprehensive account of how EA, EP, and creativity affect the EIs of the sampled students. The findings indicate that EA, EP, and creativity wield significant influence over EIs. This implies that these three factors substantially contribute to shaping the students' intentions to engage in entrepreneurial pursuits.

Table 14: Model

Outcome Variable: Entrepreneurial Intentions				
Particulars	Coefficients	StandardError	t-value	P-value
Constant	0.7366	0.1755	4.1973	0.000
EA	0.9187	0.0452	20.3167	0.000
Passion	0.7852	0.0389	21.2369	0.000
Creativity	-0.1867	0.0446	-4.1810	0.000

Source: Authors own source

The data presented in Table 15 showcases that EA significantly influences the EIs of the sample units, explaining 91.87% of the variance. This result validates the first hypothesis, providing strong evidence for the existence of a substantial and meaningful connection between EA and EIs of the student participants.

Table 15: Direct effect

Effect	Standard Error	t-value	P-value
0.9187	0.0452	20.3167	0.000

Source: Computed

Table 12: Indirect effects

Particulars	Effect	Boot SE	Boot LLCI	BootULCI
Total	-0.1267	0.0298	-0.1863	-0.0671
EA →Passion→EI	0.0053	0.0054	-0.0033	-0.0183
EA→Creativity→EI	0.1293	0.0295	-0.1888	-0.0714
EA→Passion→Creativity→EI	0.0028	0.0018	-0.0074	-0.0003

Source: Computed

Indirect effects convey that overall, there is a negative effect of 12.67% in EA and EIs of the students. Passion positively and creativity negatively contribute to the prime relation. However, the negative effect is brought down when both passion and creativity jointly mediate the relationship between EA and EIs of the students.

Discussion

The findings provide valuable insights into the relationship between various factors and the EIs of engineering students. It's worth noting that the variables examined, including entrepreneurial attitude, passion, creativity, and entrepreneurial intentions, did not follow a normal distribution. This suggests that the data may not conform to a typical statistical pattern, which should be considered when interpreting the results. Predominantly, the sample units were female, and a significant portion fell within the 17 to 24 years age range. Additionally, most of the surveyed engineering institutions were privately owned and located in urban areas. These demographic characteristics provide context for the study's sample composition. The study found that entrepreneurial attitude, passion, and creativity remained consistent across various personal characteristics such as "gender, age, the branch of engineering study, and type of engineering institution". This suggests that these factors are relatively stable within the surveyed student population, regardless of individual differences. Notably, there was a significant difference in EIs based on gender, with implications for tailoring

entrepreneurial programs and interventions to address potential gender-related disparities in entrepreneurial aspirations.

The study investigated the mediating role of passion and creativity in EA and EIs relations. Passion was found to positively mediate this relationship, albeit with a smaller effect compared to the direct relationship between EA and EIs. On the other hand, creativity negatively mediated the relationship, emphasizing the need for further exploration into how creativity can be harnessed to enhance EIs. The study also hypothesized that passion and creativity jointly mediate the relationship between EA and EIs. Interestingly, while passion continued to have a positive effect, creativity's negative effect was attenuated when both factors were considered together. This suggests a complex interplay between passion and creativity in shaping entrepreneurial intentions.

Importantly, entrepreneurial attitude was found to have a substantial impact on EIs, explaining a significant portion of the variance. This underscores the significance of fostering a positive entrepreneurial mindset among female students to drive their intentions toward entrepreneurship. Additionally, cultivating creativity may be a valuable strategy to further promote entrepreneurial intentions among female students. This research work contributes to our understanding of the factors influencing EIs among female engineering students. It highlights the roles of passion, creativity, and demographic factors in shaping these intentions and emphasizes the importance of nurturing entrepreneurial attitudes to foster future entrepreneurial activities. Collectively, these findings have implications for entrepreneurship education and policy. Institutions can design programs that leverage and enhance students' existing passion for entrepreneurship while also addressing potential gender-based differences.

Conclusion

The research findings unveil several key conclusions. Gender, age, academic discipline, type of educational institution, and institutional location do not significantly impact the entrepreneurial attitude, entrepreneurial passion, or creativity of female engineering students. However, there is a noteworthy variation in entrepreneurial intentions based on gender, suggesting that male and female students may differ in their inclination toward entrepreneurial pursuits. Entrepreneurial attitude has a significant and positive effect on the entrepreneurial intentions of female

students. This highlights the pivotal role that a positive attitude toward entrepreneurship plays in motivating students to consider entrepreneurial ventures. While passion positively mediated the relationship, creativity had a negative mediating effect. These results underscore the complexity of how passion and creativity interact in influencing EIs. The joint mediation analysis revealed that when both passion and creativity are considered together, the negative effect of creativity is attenuated. This suggests that passion plays a more dominant role in shaping EIs when combined with creativity. In conclusion, this study advances the understanding of the multidimensional relationship between EA, passion, creativity, and demographic factors in shaping the EIs of engineering students. While it underscores the importance of fostering a positive entrepreneurial mindset, it also highlights the need for nuanced approaches to address gender disparities and harness the combined power of passion and creativity in promoting EIs. Further research could explore strategies to harness and enhance both passion and creativity to promote entrepreneurial intentions more effectively.

References

[1] **Al Ghafri, F., & Malik, M.** (2021). Entrepreneurship education and its effect on entrepreneurial intentions of Omani undergraduate students. In *SHS Web of Conferences* (Vol. 124, p. 05005). EDP Sciences.

[2] **Amofah, K., & Saladrigues, R.** (2022). Impact of attitude towards entrepreneurship education and role models on entrepreneurial intention. *Journal of Innovation and Entrepreneurship*, 11(1), 36.

[3] **Anjum, T., Farrukh, M., Heidler, P., & Tautiva, J. A. D.** (2021). Entrepreneurial intention: Creativity, entrepreneurship, and university support. *Journal of Open Innovation: Technology, Market, and Complexity*, *7*(1), 1–13. https://doi.org/10.3390/joitmc7010011

[4] **Bignetti, B., Santos, A. C., Hansen, P. B., & Henriqson, E.** (2021). The influence of entrepreneurial passion and creativity on entrepreneurial intentions. RAM. *Revista de Administração Mackenzie, 22*, eRAMR210082.

[5] **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. https://doi.org/https://doi.org/10.1111/jsbm.12242

[6] **Cardon, M. S., Gregoire, D. A., Stevens, C. E., & Patel, P. C.** (2013). Measuring entrepreneurial passion: Conceptual foundations and scale validation. *Journal of Business Venturing*, *28*(3), 373–396.

https://doi.org/10.1016/j.jbusvent.2012.03.003

[7] **Chasserio, S., Pailot, P., & Poroli, C.** (2014). When entrepreneurial identity meets multiple social identities : Interplays and identity work of women entrepreneurs. *International Journal of Entrepreneurial Behavior & Research, 20*(2), 128-154.

[8] **Choitung, L., Sun, H., & Law, K**. (2012). Comparing the Entrepreneurial Intention between Female and Male Engineering Students. *Journal of Women's Entrepreneurship and Education, 1*(2), 28-51. Retrieved from https://library.ien.bg.ac.rs/index.php/jwee/article/view

[9] **Dali, F., Hashim, H., Halid, R. A., Khalid, Aziah, N., & Kadir, A.** (2021). Creativity and Youth Entrepreneurial Intention: A Conceptual Model. *Insight Journal*, *8*(3), 83–104.

[10] **Ediagbonya, K.** (2023). Entrepreneurship Education, Entrepreneurial Creativity and Entrepreneurial Mindset As Correlates of Business Education Students' Entrepreneurial Intention in Edo State. *Asian Journal of Vocational Education and Humanities*, *4*(2), 15–21. www.mjosteve.com

[11] **Fayolle, A., & Gailly, B.** (2015). The Impact of Entrepreneurship Education on Entrepreneurial Attitudes and Intention: Hysteresis and Persistence. *Journal of Small Business Management*, *53*(1), 75–93. https://doi.org/10.1111/jsbm.12065

[12] **Ferreira-Neto, M. N., de Carvalho Castro, J. L., de Sousa-Filho, J. M., & de Souza Lessa, B.** (2023). The role of self-efficacy, entrepreneurial passion, and creativity in developing entrepreneurial intentions. *Frontiers in Psychology*, *14*(March), 1–14. https://doi.org/10.3389/fpsyg.2023.1134618

[13] **Filter, H.** (2020). *Investigating the Influence of Gender on the Experience of Entrepreneurial Passion: A Quantitative Study*. Retrieved from University of twente student theses http://essay.utwente.nl/81854/

[14] **Gerba, D.** (2012). Impact of entrepreneurship education on entrepreneurial intentions of business and engineering students in Ethiopia. *African Journal of Economic and Management Studies*.

[15] **Gure, G.** (2017). Gender Influences on the Entrepreneurial Tendencies & Entrepreneurial Attitude of University Students. *International Journal of Research in Social Sciences, 8*, 746-759.

[16] **Hayes, J. R.** (2012). Modelling and remodelling writting. *Written Communication*, 369-388. Retrieved from https://doi.org/10.1177/0741088312451260

[17] **Jiatong, W., Murad, M., Bajun, F., Tufail, M. S., Mirza, F., & Rafiq, M.** (2021). Impact of Entrepreneurial Education, Mindset, and Creativity on Entrepreneurial Intention: Mediating Role of Entrepreneurial Self-Efficacy. *Frontiers in Psychology*, *12*(August), 1–13. https://doi.org/10.3389/fpsyg.2021.724440

[18] **Law, K., & Breznik, K.** (2017). Impacts of innovativeness and attitude on entrepreneurial intention: Among engineering and non-engineering students. *International Journal of Technology and Design Education, 27*(4), 683-700.

[19] **Liñán, F., Rodríguez-Cohard, J. C., & Rueda-Cantuche, J. M.** (2011). Factors affecting entrepreneurial intention levels: a role for education. *International Entrepreneurship and Management Journal*, *7*(2), 195–218. https://doi.org/10.1007/s11365-010-0154-z

[20] **Manjaly, N. B., Joseph, G., P.M., N., & Kailash, N.** (2022). Entrepreneurial Intention of Indian Women University Students: The Role of Entrepreneurial Self-Assessment and Entrepreneurial Passion. *Journal of Women's Entrepreneurship and Education, 3*(4), 273-290. Retrieved from https://www.library.ien.bg.ac.rs/index.php/jwee/article/view/1508/1296

[21] **Moses, C. L., Olokundun, M. A., Akinbode, M., Agboola, M., & Inelo, F.** (2016). Entrepreneurship education and entrepreneurial intentions: The moderating role of passion. *The Social Sciences*, 11(5), 645-653.

[22] **Murad, M., Li, C., Ashraf, S. F., & Arora, S.** (2021). The influence of entrepreneurial passion in the relationship between creativity and entrepreneurial intention. *International Journal of Global Business and Competitiveness*, 16(1), 51-60.

[23] **Nguyen, T. T., Phan, H. T. T., & Pham, V. T.** (2021). Impact of creativity on student entrepreneurial intention. *International Journal of Innovation*, *9*(3), 646–663. https://doi.org/10.5585/iji.v9i3.19659

[24] **Oktavio, A., Mitasari, R., Sinarta, Y., Kusumawidjaya, E., Wijaya, V., & Widyawati, C.** (2023). Indonesian Students' Entrepreneurial Behavior: The Effect of Creativity, Passion, Alertness and Intention. *Journal of Eastern European and Central Asian Research*, *10*(2), 227–237. https://doi.org/10.15549/jeecar.v10i2.1039

[25] **Radiman, Sukiman, & Rizal Agus.** (2021). The Influence of Creativity and Proactive Attitude Towards Entrepreneurial Intentions of Students at Islamic Colleges Private in Medan City. *IHTIFAZ: Islamic Economics, Finance, and Banking*, *6*(6), 196–205. http://seminar.uad.ac.id/index.php/ihtifaz/article/view/6055

[26] **Saboor, M. J., Yousaf, I., & Paracha, A.** (2020). Entrepreneurial Passion and Intention: Creativity and Perceived Behavioral Control as Mediators. *Journal of Managerial Sciences*, *14*(2), 11–19.

[27] **Setia, B., & Nuringsih, K.** (2022). Shaping Intention among Students in Environmental Entrepreneurship through Entrepreneurial Education and Environmental Concern. In *Tenth International Conference on Entrepreneurship and Business Management 2021* (ICEBM 2021) (pp. 109-115). Atlantis Press.

[28] **Swail, J., & Marlow, S.** (2018). Embrace the masculine; attenuate the feminine' – gender, identity work and entrepreneurial legitimation in the

nascent context. *Entrepreneurship & Regional Development, 30*(1-2), 256-282. https://doi.org/10.1080/08985626.2017.1406539

[29] **Thuy, D. T. T., Linh, N. T. C., & Thanh, N. N. D.** (2020). The mediating role of passion in entrepreneurship intention: Identity centrality and role models increase passion. *Hcmcoujs - Economics and Business Administration*, *10*(1), 101–119. https://doi.org/10.46223/hcmcoujs.econ.en.10.1.223.2020

[30] **Wach, K., & Bilan, S.** (2023). Creativity of Students in Favour of Their Entrepreneurial Intentions: Empirical Evidence From Poland. *Creativity Studies*, *16*(1), 211–224. https://doi.org/10.3846/cs.2023.15028

[31] **Waele, S. De.** (2020). *The Relationship between Creativity and Entrepreneurial Intentions*.

[32] **Wathanakom, N., Khlaisang, J., & Songkram, N.** (2020). The study of the causal relationship between innovativeness and entrepreneurial intention among undergraduate students. *Journal of Innovation and Entrepreneurship*, *9*(1), 1–13. https://doi.org/10.1186/s13731-020-00125-5

[33] **Yordanova, D., & Tarrazon, M.** (2010). Gender differences in entrepreneurial intentions: Evidence from Bulgaria. *Journal of Developmental Entrepreneurship, 15*(03), 245-261.

Appendix

Table 1A : Scales employed to collect data

Particulars	Scale	Authors	Total items
Entrepreneurial attitude(EA)	EA scale	Fayolle & Gailly (2015)	6
Entrepreneurial Passion(EP)	EP scale	Cardon et al., (2013)	13
Creativity	Creativity scale	Biragalia & Kadile (2017)	4
Entrepreneurial Intentions (EIs)	EIs scale	Liñán et al., (2011)	6

Article history: Received: September 22nd, 2023
Accepted: December 25th, 2023