

Entrepreneurial Intention Among Engineering Students: Mediating Effect of Locus of Control

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For most colleges today, contributing to the economy has become a major problem. To meet these challenges, universities began to promote entrepreneurship education among their students. Past studies reveal that personality traits significantly impact entrepreneurial intentions. Hence, the present study aims to analyze the mediation of locus of control for attitudes towards entrepreneurship and entrepreneurial intentions among engineering students. The responses were collected from 600 engineering students in the district of Indore. The results of a simple mediation analysis show that the locus of control has a partial mediating effect on the attitude towards entrepreneurship and entrepreneurial intention relationship.

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Introduction

There is a need to learn how to develop and encourage young entrepreneurs while they are still in school, as per the impact of entrepreneurship education (Indarti et al., 2016). Individual context variables such as demographics, personality, social, climate, and knowledge that affect individual behavior were included in Ajzen's (2005) modified theory of planned behavior. Based on this breakthrough, various researchers hypothesized that the context influences, particularly entrepreneurial learning. Contextual support and personality factors (personality traits) played an important role in the development of entrepreneurial purpose and behavior. This has sparked a debate about whether predicting entrepreneurial intentions through personality traits is affected by the mediating variables such as motivational factors and perceptions (Baum et al., 2001). However, the literature has generally disregarded the significance of mediating factors in entrepreneurship (Rauch & Frese, 2007).

Previous researches indicated that attitude towards entrepreneurship and lo-

cus of control positively affects entrepreneurial intention (EI) (Jain & Arora, 2020). It was found that, despite the significance of entrepreneurship in the growth of economies, most of the previous studies focused on developed countries; there has been a dearth of empirical research on students' entrepreneurial attitudes, intentions, and motivation in the context of developing countries. This study aims to fill this gap. It identifies the locus of control in the effectiveness of entrepreneurial attitude in EI in higher education institutions.

Hypothesis Development

Attitude towards Entrepreneurship (ATE) and Entrepreneurial Intention (EI): Entrepreneurship is a broader term than the mere establishment of a business (Jena, 2020). Entrepreneurship is widely regarded as a phenomenon that can be taught (Johnson et al., 2006), and as a result, most universities are investing large resources to entrepreneurial education. Stoica et al. (2020) studied the three categories of entrepreneurship that impact economic growth which include early stage entrepreneurship opportunities, entrepreneurship based on opportunity and entrepreneurship based on necessity. They found that opportunity-driven entrepreneurship and early-stage entrepreneurship are the key elements in stimulating economic growth. In order to face the challenge of employability, most institutions had center of attention on building entrepreneurial attitudes and abilities among their undergraduates so that their ideas can be turned into practice. Furthermore, such characteristics

and skills enable pupils to enter the labor force. Baber (2022) suggests a positive influence of attitude on entrepreneurial intentions. As per Guerrero and Urbano (2012), scholars having education in entrepreneurship are more probable than those who have not studied entrepreneurship education to start their own businesses. Although entrepreneurship education cannot ensure the success of a new business, the teaching and learning methods utilized by educational institutions can be advantageous (Rodrigues, 2004). Souitaris et al. (2007) advocated that colleges focus on their goal, assistance, and environment in order to boost students' entrepreneurial intent. Zollo et al. (2017) proposed that if education institutes give appropriate information and motivation for entrepreneurship, the possibility of youngsters choosing their profession as entrepreneurship can increase. As a result, based on these considerations and the future need, there is still a need to investigate the relationship between ATE and EI, this study proposed the following hypotheses:

H₁: ATE has a positive impact on students' EI.

Attitude towards Entrepreneurship (ATE) and Locus of Control (LOC): An optimistic mindset when it comes to starting a business is an essential determinant of aspiring to be an entrepreneur. The present study ascertained the relationship between the two variables as suggested by past studies including Doanh and Bernat (2019) and Munir et al., (2019). For businessmen, internal LOC refers to psychological factors that influence their

attitude and behavior. From a theoretical standpoint, LOC can be observed as a possible element in determining whether a small business owner is responsive and pursues opportunities that others overlook in a particular economic scenario. Furthermore, people who have an internal LOC are more prone to assume that environmental forces, such as the economy, may be affected rather than passively accepted (Ward, 1993; Wheatley et al., 1991). Based on a comprehensive review by Sapp and Harrod (1993) and others cited in this study, it is thought that there is a relationship between entrepreneurs and the presence of an internal LOC and further research into the relationship between the ATE and LOC is required, this study proposed the following hypotheses:

H₂: ATE has a positive impact on students' LOC

LOC in entrepreneurship education is crucial because it can inspire prospective entrepreneurs to initiate their own businesses.

Locus of Control (LOC) and Entrepreneurial Intention (EI): Entrepreneurial literacy, self-efficacy and LOC are all important in cultivating a student's entrepreneurial spirit. According to Wilson et al. (2007), LOC in entrepreneurship education is crucial because it can inspire prospective entrepreneurs to initiate their own businesses. The characteristics of LOC, innovation, and achievement must have a positive impact on entrepreneurship interest (Kusmintartiet al.,

2014). Entrepreneurs who run a profitable business have a much higher initial internal LOC orientation than those who run a failing business (Brockhaus, 1980). Inner sense of control (internals) has been linked to entrepreneurial activity and a desire for new tactics (Hansemark, 2003; Mueller & Thomas, 2001; Boone et al., 1996; Miller & Toulouse, 1986; 1985; Miller, 1983; Miller et al., 1982; De Vries, 1977; Brockhaus, 1975). According to Pliakoura (2021) internal LOC has a positive relationship with the intention of entrepreneurship. Despite the fact that there is still work to be done to investigate the association between the LOC and EI, this study proposed the following hypotheses:

H₃: LOC has a positive impact on students' EI

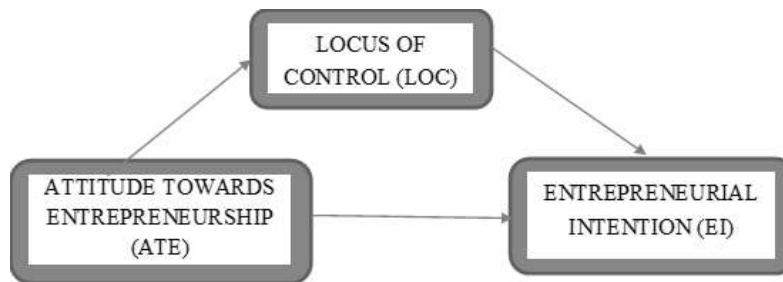
Mediating Role of Locus of Control (LOC): The concept of LOC refers to the belief that one's personal characteristics can impact specific outcomes (Rotter, 1966). A previous study has mainly focused on the relationship between LOC and entrepreneurship (Shane, 2003). As a result, in order to cultivate entrepreneurs, today's institutions must focus on shaping the constructive trail among their students. Considering LOC is a multidimensional variable, this study adhered to Lumpkin's (1988) principles and examined it in terms of chance, internal LOC, and powerful others. According to the study's findings, students exposed to a supportive environment at their university are more likely to mold their LOC, which influences their goals to become entrepreneurs. LOC is influ-

enced by context, as evidenced by a study on EI, which found that those with a higher external LOC outperformed others (Król et al., 2019). Most of the characteristics have been studied in relation to EI in entrepreneurship career studies (Schlaegel & Koenig, 2014). We anticipate that EI will have a greater impact

on individuals who believe in their capacity to seek out chances (Luet al., 2018). Therefore, we propose the following hypotheses:

H₄: LOC mediates the association between ATE and EI.

Fig. 1 Conceptual Model



The Study

The current study is based on exploratory research and examines the usefulness of ATE in EI in higher educational institutions and a mediating effect of LOC among students of engineering institutes, in the district of Indore Madhya Pradesh, India. The research is based on primary data collected via a questionnaire. Indore is renowned as Madhya Pradesh's educational center. The present study was carried out on students from engineering institutes in the district of Indore. A multi-stage random sampling procedure was employed to determine the sample frame, and 600 students were interviewed from the selected group of engineering institutes.

Data Collection

Questionnaire adopted in this study consists of close ended questions. For pri-

mary data collection, the questionnaire on EI was adopted from Asmara et al. (2016) and Liñán and Chen (2009); questions pertaining to ATE was adopted from Asmara, et al. (2016); Liñán and Chen (2009); and Lüthje and Franke (2003); questions pertaining to LOC was adopted from Kristiansen and Indarti (2004). The questionnaire is made up of 32 closed-ended questions on an interval scale. Respondents were asked to rate their level of agreement with each of the questions on a five-point Likert scale. Secondary data was gathered from a variety of research periodicals, journals, and newspapers. Analysis of the data was conducted by simple mediation process through PROCESS macro software in SPSS.

Conceptual Model

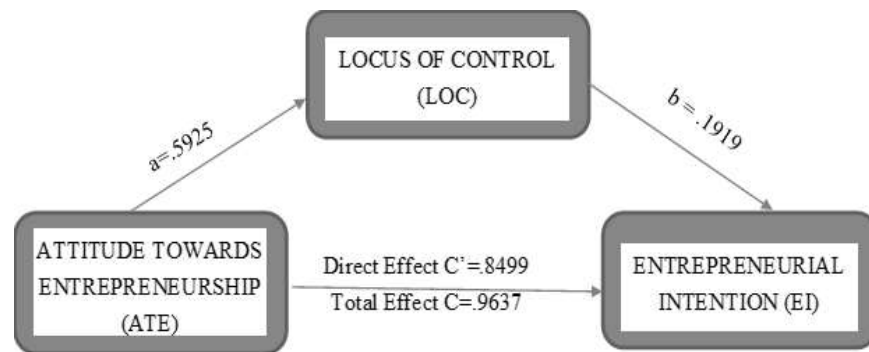
The hypothesized mediation model (Fig. 1) was tested in a single model us-

ing a bootstrapping approach to assess the significance of the indirect effects at differing levels of the mediator (Hayes, 2013). Entrepreneurial intention and ATE was the predictor variable, with locus of control as the mediator. The outcome variable was entrepreneurial intention and locus of control was the proposed mediator. Mediation analyses test the conditional indirect effect of a mediating variable (i.e., LOC) on the relationship between a predictor (i.e., attitude towards entrepreneurship) and an outcome variable (i.e., entrepreneurial intention) via potential mediators (i.e., locus of control). The “PROCESS” macro, model 7, v2.16 (Hayes, 2013) in SPSS ver 23 with bias-corrected 95% confidence intervals (n = 1000) was used to test the significance of the indirect (i.e., mediated) ef-

fects mediated by locus of control, i.e., conditional indirect effects. This model explicitly tests the moderating effect on the predictor to mediator path (i.e., path a). An index of mediation was used to test the significance of the mediation, i.e., the difference of the indirect effects across entrepreneurial intention (Hayes, 2015). Significant effects are supported by the absence of zero within the confidence intervals.

Reliability of the Measures

The data was found to be reliable and was evaluated through Chronbach’s alpha which was applied on 32 items of questionnaire. The value of Chronbach’s alpha was 0.954 so data was found to be reliable for further investigation.



Estimate, confidence intervals and p- value is reported through output result.

A bootstrapping method was performed using SPSS Process Macro to examine if locus of control mediated the relationship between attitude towards entrepreneurship and entrepreneurial intention. First, the results of the regression analysis show that the attitude towards entrepreneurship (independent variable) was a significant predictor of

locus of control (b = .19, t = 4.00, p < .001). Next, while controlling for locus

While controlling for locus of control (mediator), the results of the second regression analysis show that attitude towards entrepreneurship was significant predictor of entrepreneurial intention.

of control (mediator), the results of the second regression analysis show that attitude towards entrepreneurship was significant predictor of entrepreneurial intention (dependent variable ($b = .85$, $t = 22.77$, $p < .001$). The results of the indirect effect based on 1000 bootstrap samples show a significant relationship between attitude towards entrepreneurship and entrepreneurial intention mediated by locus of control ($a*b = .12$,

Bootstrap $CI_{95} = .05$ and $.19$). The mediator, locus of control, accounted for approximately 59% of the total effect on entrepreneurial intention [$PM = (.12) / (.96)$]. On the other hand, there was statistically significant direct effect between attitude towards entrepreneurship and entrepreneurial intention ($b = .84$, $t = 22.77$, $p < .001$). Table 1 displays the results of the mediation analysis.

Table 1 Mediation Analysis

Variable/ Effect	B	SE	T	p	95%Confidence Interval	
ATE → EI	.8499	.0373	22.7714	< 0.001	.7766	.9233
ATE → LOC	.1919	.0480	4.0005	< 0.001	.0977	.2861
ATE → LOC → EI	.5925	.0206	28.7364	<0.001	.5520	.6330
Effect						
Direct	.8499	.0373	22.7714	<0.001	.7766	.9233
Indirect	.1212	.0361			.0521	.1958
Total	.9637	.0245	39.3471	< 0.001	.9156	1.0118

The output exhibit the “Estimate”, which is the average indirect coefficient of the bootstrap samples, as well as the 95 percent confidence intervals and the p-value for the significance test. A simple mediation study indicated that, in addition to its association with LOC, ATE is indirectly associated to EI. First, as observed in ATE and LOC, they are significantly connected ($a = 0.5925$; $p 0.001$), as are LOC and EI ($b = 0.1919$; $p 0.001$). Based on 1,000 bootstrap samples, a 95 percent bias-corrected confidence interval suggested that the indirect impact ($ab = .1137$) was absolutely above zero (.0499 to .1842). It shows a partial mediating impact on ATE and EI relationship. The previous studies also show a partial mediating impact of LOC on ATE and EI relationship (Anwar et al., 2021; Uysal

et al., 2022; Ida Ketut, 2019; Baluku et al., 2018; Darmanto Yuliari, 2018).

Conclusion

Despite their complexity, modern computers and software make mediation much more approachable. We were able to assess the mediating impact of locus of control in attitude toward entrepreneurship and entrepreneurial purpose using the PROCESS macro for SPSS (Hayes, 2018). The findings indicate that LOC has a partial mediation effect on entrepreneurial attitude and the link between entrepreneurial intentions. All sectors, particularly the government, universities, and corporate sector, must pay more attention to entrepreneurial students. Government agencies, such as the

Department of Education, must improve entrepreneurial student ventures through policies that provide assistance, preparation, education, and monitoring. Universities must pay more attention to and make more efforts to foster entrepreneurship on campus through business courses.

References

- Ajzen, I. (2005), *Attitudes, Personality, and Behavior*. McGraw-Hill Education (UK).
- Anwar, I.; Jamal, M.; Saleem, I. & Thoudam, P. (2021), "Traits and Entrepreneurial Intention: Testing the Mediating Role of Entrepreneurial Attitude and Self-efficacy", *Journal for International Business and Entrepreneurship Development*, 13(1): 40-60.
- Asmara, H., Djatmika, E. & Indrawati, A. (2016), "The Effect of Need for Achievement and Risk Taking Propensity on Entrepreneurial Intention through Entrepreneurial Attitude", *IOSR Journal of Business and Management*, 18(6): 117-26.
- Baber, H. (2022), "Entrepreneurial and Crowdfunding Intentions of Management Students in South Korea", *World Journal of Entrepreneurship, Management and Sustainable Development*, 18(1): 1-14.
- Baluku, M., Bantu, E. & Otto, K. (2018), "Effect of Locus of Control on Entrepreneurial Attitudes and Self-employment Intentions: The Moderating Role of Individualism", *Journal of Enterprising Culture*, 26(03): 251-83.
- Baum, J., Locke, E. & Smith, K. (2001), "A Multidimensional Model of Venture Growth", *Academy of Management Journal*, 44(2):92-303.
- Boone, C., De Brabander, B. & van Witteloostuijn, A. (1996), "CEO Locus of Control and Small Firm Performance: An Integrative Framework and Empirical Test", *Journal of Management Studies*, 33: 667-99.
- Brockhaus, R. (1980), "Psychological and Environmental Factors Which Distinguish the Successful from the Unsuccessful Entrepreneur: A Longitudinal Study", *Proceedings, Academy of Management*, 1980(1): 368-72.
- Brockhaus, R. (1975), "I-E Locus of Control Scores as Predictors of Entrepreneurial Intentions", *Proceedings of the Academy of Management*, 1975(1): 433-35.
- Darmanto, S. & Yuliari, G. (2018), "Mediating Role of Entrepreneurial Self-efficacy in Developing Entrepreneurial Behavior of Entrepreneur Students", *Academy of Entrepreneurship Journal*, 24(1): 1-14.
- De Vries, M. (1977), "The Entrepreneurial Personality: A Person at the Crossroads", *Journal of Management Studies*, 14(1): 34-57.
- Guerrero, M. & Urbano, D. (2012), "The Development of an Entrepreneurial University", *The Journal of Technology Transfer*, 37(1): 43-74.
- Hansemark, O. (2003), "Need for Achievement, Locus of Control and the Prediction of Business Start-ups: A Longitudinal Study", *Journal of Economic Psychology*, 24(3): 301-19.
- Hayes, A. (2018), "Partial, Conditional, and Moderated Mediation: Quantification, Inference, and Interpretation", *Communication Monographs*, 85(1): 4-40.
- Ida Ketut, K. (2019), "The Prediction of Need for Achievement to Generate Entrepreneurial Intention: A Locus of Control Mediation", *International Review of Management and Marketing*, 9(4): 54-62.
- Indarti, N., Rostiani, R. & Nastiti, T. (2016), "Underlying Factors of Entrepreneurial Intentions among Asian Students", *The South East Asian Journal of Management*, IV (2): 143-60.
- Jain, Shakuntla & Arora, Swaranjeet (2020), "Impact of Entrepreneurial Traits on Entrepreneurial Intentions among Management Stu-

- dents”, *The Indian Journal of Industrial Relations*, 56(1): 131- 43.
- Jena, R. (2020), “Measuring the Impact of Business Management Student’s Attitude towards Entrepreneurship Education on Entrepreneurial Intention: A Case Study”, *Computers in Human Behavior*, 107: 106275.
- Johnson, D., Craig, J. & Hildebrand, R. (2006), “Entrepreneurship Education: towards A Discipline Based Framework”, *Journal of Management Development*. 25(1): 40-54.
- Kristiansen, S. & Indarti, N. (2004), “Entrepreneurial Intention among Indonesian and Norwegian Students”, *Journal of Enterprising Culture*, 12(1): 55-78.
- Król, M.; Klic̓, A.; Kustra, M. & Szymański, K. (2019), “Is Knowledge of Family History Related to Psychosocial Functioning? Comparison of Adolescents Living in Institutional Care and Adolescents Living with Their Biological Families”, *European Journal Development Psychology*. 16: 464–75.
- Kusmintarti, A.; Thoyib, A.; Ashar, K. & Maskie, G. (2014), “The Relationships among Entrepreneurial Characteristics, Entrepreneurial Attitude, and Entrepreneurial Intention”, *Journal of Business and Management*, 16(2): 25-32.
- Liñán, F. & Chen, Y. (2009), “Development and Cross Cultural Application of a Specific Instrument to Measure Entrepreneurial Intentions”, *Entrepreneurship Theory and Practice*, 33(3): 593-617.
- Lu, X., Xie, B.]& Guo, Y. (2018), “The Trickle-down of Work Engagement from Leader to Follower: The Roles of Optimism and Self-efficacy”, *Journal of Business Research*, 84:186–95.
- Lumpkin, J. (1988), “Establishing the Validity of an Abbreviated Locus of Control Scale: Is a Brief Levenson’s Scale any Better”? *Psychological Reports*, 63(2): 519-23.
- Lüthje, C. & Franke N. (2003), “The Making of an Entrepreneur: Testing a Model of Entrepreneurial Intent among Engineering Students at MIT”, *R&D Management*, 33(2): 135- 47.
- Miller, D. (1983), “The Correlates of Entrepreneurship in Three Types of Firms”, *Management Science*, 29(7): 770–91.
- Miller, D. and Toulouse, J. (1985). “Strategy, Structure, CEO Personality and Performance in Small Firms”, *American Journal of Small Business*, 10(3): 47-62.
- Miller, D. & Toulouse, J. M. (1986), “Chief Executive Personality and Corporate Strategy and Structure in Small Firms”, *Management Science*, 32(11): 1389-1409.
- Miller, D., Kets de Vries, M. & Toulouse, J. (1982), “Top Executive Locus of Control and its Relationship to Strategy-making, Structure, and Environment”, *Academy of Management Journal*, 25 :237–53.
- Mueller, S. & Thomas, A. (2001), “Culture and Entrepreneurial Potential: A Nine Country Study of Locus of Control and Innovativeness”, *Journal of Business Venturing*, 16(1): 51–75.
- Munir, H.; Jianfeng, C. & Ramzan, S. (2019), “Personality Traits and Theory of Planned Behavior Comparison of Entrepreneurial Intentions between an Emerging Economy and a Developing Country”, *International Journal of Entrepreneurial Behavior & Research*, 25(3): 554-80
- Nunnally, C. (1978), *Psychometric Theory*, McGraw-Hill: New York, NY.
- Pliakoura, A.; Beligiannis, G.; Chatzitheodoridis, F. & Kontogeorgos, A. (2021), “The Impact of Locus of Control and Motivations in Predicting Entrepreneurial Intentions among Farmers: a Field Research”, *Journal of Agribusiness in Developing and Emerging Economies*, 12(2):183-203.
- Rauch, A. & Frese, M. (2007), “Let’s put the Person back into Entrepreneurship Research: A Meta Analysis on the Relationship between Business owners’ Personality Traits, Business Creation and Success”,

- European Journal of Work and Organizational Psychology*, 16 (4):353-85.
- Rodrigues, C. (2004), "The Importance Level of Ten Teaching/Learning Techniques as Rated by and Instructors", *Journal of Management Development*, 23(2): 169-82.
- Rotter, J. (1966), "Generalized Expectancies for Internal Versus External Control of Reinforcement", *Psychological Monographs: General and Applied*, 80(1): 1
- Sapp, S. & Harrod, W. (1993), "Reliability and Validity of a Brief Version of Levenson's Locus of Control Scale", *Psychological Reports*, 72 (2): 539-550.
- Schlaegel, C. & Koenig, M. (2014), "Determinants of Entrepreneurial Intent: A Meta Analytic Test and Integration of Competing Models", *Entrepreneurship Theory and Practice*, 38(2): 291–332.
- Shane, S. (2003), *A General Theory of Entrepreneurship: The Individual-Opportunity Nexus*. Edward Elgar Publishing.
- Souitaris, V.; Zerbinati, S. & Al-Laham, A. (2007), "Do Entrepreneurship Programs Raise Entrepreneurial Intention of Science and Engineering Students? The Effect of Learning, Inspiration and Resources", *Journal of Business Venturing*, 22(4): 566-91.
- Turker, D. & Selcuk, S. (2009), "Which Factors Affect Entrepreneurial Intention of University Students?" *Journal of European Industrial Training*. 33(2): 142-59.
- Uysal, A., Karadağ, H.; Tuncer, B., and Şahin, F. (2022), "Locus of Control, Need for Achievement, and Entrepreneurial Intention: A Moderated Mediation Model", *The International Journal of Management Education*, 20(2):1-15.
- Ward, E. (1993), "Motivation of Expansion Plans of Entrepreneurs and Small Business Managers", *Journal of Small Business Management*, 31(1): 32-38.
- Wheatley, W., Anthony, W. & Maddox, E. (1991), "Selecting and Training Strategic Planners with Imagination and Creativity", *Journal of Creative Behavior*, 25(1): 52- 60.
- 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
- Zollo, L.; Laudano, M.; Ciappei, C. & Zampi, V. (2017), "Factors Affecting Universities' Ability to Foster Students' Entrepreneurial Behavior: An Empirical Investigation", *Journal of Management Development*, 36(2): 268-85.