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Digital Entrepreneurship Education, Entrepreneurial Competence, and Entrepreneurial Intention: Evidence from a Mediated Model

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Abstract

This research explores how digital entrepreneurial education and training influence digital entrepreneurial intention (EI), with entrepreneurial competence functioning as an intervening variable. The study is based on 391 employee responses collected through convenience and snowball sampling. The results demonstrate that digital entrepreneurial education and training positively affect both entrepreneurial competence and EI. Moreover, entrepreneurial competence serves as a mediating factor in the relationship between digital entrepreneurial education and training activities and EI. This study makes an original contribution by jointly examining digital entrepreneurial education and training, entrepreneurial competence, and digital entrepreneurial intention within a single analytical framework. The study is designed to advance digital entrepreneurship. Its implications are relevant for policymakers, entrepreneurs, venture capitalists, angel investors, and international development organizations.

Keywords: Digital entrepreneurial, Education, Training, Entrepreneurial intention, Entrepreneurial competence, Mediating effect

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Introduction

In the twenty-first century, entrepreneurship remains a central force in driving economic development worldwide, including in India, one of the largest and rapidly expanding economies. However, existing studies highlight a persistent challenge: inadequate access to comprehensive entrepreneurial education and training [1, 2]. Economic expansion generates new opportunities and accelerates both social and financial progress by fostering business-friendly environments [3, 4]. In this sense, financial development contributes to overall advancement by raising investment levels, improving capital access, enhancing resource allocation efficiency, improving risk management, fostering technological progress and innovation, reducing poverty, and enhancing social welfare. Consequently, investment in education and training is essential for achieving entrepreneurial objectives and preparing individuals for future entrepreneurial roles [5, 6].

Entrepreneurial preparation enables individuals to detect business opportunities while also building the confidence, knowledge, and competencies needed to exploit them. It involves learning how to identify opportunities, develop ideas, manage resources, and establish new ventures. This perspective aligns with established learning theories, which emphasize that meaningful learning—supporting both application and re-conceptualization—emerges primarily through experiential learning and active participation [7].

Education and training are known to shape entrepreneurial behavior [8, 9], yet this area remains underexplored in several contexts, particularly in the context of digital entrepreneurship, an emerging phenomenon in India. Researchers [8, 9] have



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employed the Theory of Planned Behavior (TPB), introduced by [10], to explain how education and training influence individuals. TPB suggests that human actions are planned, regulated, and rational, meaning individuals evaluate expected outcomes before engaging in behavior [11]. This model has been widely used to predict diverse behavioral patterns and offers a useful framework for understanding how education and training programs can shape entrepreneurial intentions and risk-related decisions such as venture creation [12, 13].

Digital entrepreneurship has become one of the most dominant forms of entrepreneurial activity [14]. Its importance is also reflected in India's Ministry of Skill Development and Entrepreneurship policy, which emphasizes inclusive learning and highlights the need to invest in knowledge and skills that foster entrepreneurship and innovation [14]. Within this context, digital entrepreneurial intention refers to employees' willingness to initiate and manage a digitally based business venture [15]. It reflects a strong conviction in the ability of digital platforms and technologies to generate innovative and profitable opportunities [15].

Entrepreneurial competence refers to an individual's cognitive orientation, skill set, and knowledge base that enable them to recognize opportunities, address challenges, and develop ideas over time [16]. In this study, entrepreneurial competence (EC) is understood as a combination of entrepreneurial skills, knowledge, and motivation. [17] describe entrepreneurial competence as involving initiative, creativity, innovation, and willingness to take risks. Digital entrepreneurship education refers to structured efforts to develop the skills and knowledge required for individuals to successfully create and manage digital business ventures [18-20].

The primary objective of this study is to examine the contribution of digital training programs to the advancement of entrepreneurship, offering valuable insights for government bodies, angel investors, venture capital firms, and various entrepreneurial organizations regarding the digital entrepreneurship ecosystem and effective ways to support its development. Based on this objective, the study addresses the following research questions:

RQ1. In what ways do different entrepreneurial education and training practices influence entrepreneurial competence and entrepreneurial intention?

RQ2. What is the effect of entrepreneurial competence on entrepreneurial intention among employees?

RQ3. How does entrepreneurial competence function as a mediating factor in the relationship between entrepreneurial education and training practices and entrepreneurial intention among employees?

Over the past decade, India has witnessed the rapid growth of a dynamic start-up ecosystem [21]. Promoting entrepreneurial intention within the information technology (IT) sector can strengthen this ecosystem by fostering an innovation-oriented culture, attracting investment, and supporting high-growth start-ups [22]. Encouraging entrepreneurial intentions among IT professionals can also cultivate continuous learning and skill enhancement within organizations [23]. This, in turn, may lead to higher employee engagement, improved job satisfaction, and increased talent retention across the sector [24, 25].

Moreover, strengthening entrepreneurial intentions within the IT sector can enhance India's global competitiveness by improving productivity, advancing technological development, and fostering an innovation-driven entrepreneurial culture aligned with global trends [24]. However, it is important to recognize that strategies aimed at fostering entrepreneurial intention in the IT sector must consider India-specific contextual factors such as cultural norms, policy frameworks, infrastructure conditions, and access to resources [21]. Overall, by promoting entrepreneurial intentions and ensuring appropriate educational and institutional support, India can leverage its IT capabilities to stimulate economic growth, innovation, and employment creation while positioning itself as a global leader in technology and entrepreneurship [26].

Literature review and hypothesis development

Digital entrepreneurship training and entrepreneurial intention

Digital entrepreneurship education equips individuals with the knowledge and competencies to successfully initiate and manage digital business ventures [18]. This form of education is delivered through multiple platforms, such as online learning programs, mentoring schemes, and entrepreneurship accelerator initiatives [18]. Numerous universities and higher education institutions incorporate digital entrepreneurship modules or full programs within their business-related curricula. In addition, a wide range of online learning opportunities exists, including Massive Open Online Courses (MOOCs) and digital entrepreneurial communities, which provide guidance and support for emerging digital entrepreneurs. Within the broader field of entrepreneurship education and training, an increasing number of studies are focusing on how digital technologies shape entrepreneurial intention (EI).

Existing empirical findings on entrepreneurial training, particularly in the domain of digital entrepreneurship, suggest that many training initiatives suffer from weak content design and ineffective instructional approaches. Such shortcomings may negatively influence attitudes and perceived behavioral control toward entrepreneurship, while also limiting the ability of training programs to encourage entrepreneurial engagement and provide realistic experiential learning opportunities [27]. In a qualitative study involving ten semi-structured interviews with digital entrepreneurs in France and the United Arab Emirates,

it was found that entrepreneurial alertness, adaptability, and individual entrepreneurial traits play a significant role in shaping entrepreneurial intention [28].

Furthermore, technological innovation has been shown to influence entrepreneurial intention and risk perception, with experiential learning approaches reinforcing entrepreneurial intention and suggesting that information and communication technologies (ICTs) strengthen the relationship between innovation orientation and risk-taking behavior [29]. Similarly, [30] highlight that internet penetration, landline infrastructure, and mobile technologies significantly affect entrepreneurial performance. The combined influence of ICT-based experiential learning on entrepreneurial intention and risk orientation further indicates that digital technologies enhance the connection between innovative behavior and risk-taking attitudes [29]. Overall, the factors influencing entrepreneurial attitudes and their relationship with digital technologies represent a significant area of entrepreneurship research. Based on this theoretical and empirical foundation, the following hypothesis is proposed:

H1. Digital entrepreneurship training positively affects entrepreneurial intention.

Digital entrepreneurial training and entrepreneurial competencies

Entrepreneurship training has consistently been viewed as a powerful instrument for linking conceptual knowledge with real-world application. Recently, the rise of digital technologies such as social media, MOOCs, Internet of Things, big data, and 3D printing, which are transforming global societies [31], has further reinforced entrepreneurial thinking [32] and reshaped entrepreneurial activities. [33] investigate whether different instructional formats, including passive learning methods (e.g., lectures, group discussions, and company visits) versus active experiential approaches, have varying effects on the development of entrepreneurial capabilities and effectiveness.

Entrepreneurial competencies are increasingly recognized as critical career skills for operating effectively in today's labor market [34]. Given that entrepreneurship is fundamentally practice-driven, identifying the most effective components of entrepreneurial education remains essential for venture development [35].

Factors such as leadership development, verbal persuasion, and physiological states contribute to strengthening entrepreneurial self-efficacy and competence. Entrepreneurial awareness can be shaped through active participation in behavioral, cognitive, and experiential learning processes [36]. In this study, training activities include group discussions, mentorship engagement, internships, and competitions. The objective is to examine whether the structure of entrepreneurship training—particularly the balance between passive and hands-on experiential elements—explains its effect on entrepreneurial competence (EC). Based on this reasoning, the following hypothesis is formulated:

H2. Digital entrepreneurship training positively influences entrepreneurial competencies.

Entrepreneurial competencies and digital entrepreneurial intention

Entrepreneurial intention is influenced by both internal determinants, such as experience, personality traits, and skill sets, and external conditions, including social, political, and economic environments [37-39]. Digital entrepreneurial intention (EI) describes an individual's willingness to initiate and manage a business based on digital technologies [15].

Digital EI is shaped by personal factors such as motivation, creativity, willingness to take risks, and prior entrepreneurial exposure [28]. It is also affected by external conditions, including access to capital, resource availability, institutional support, and competitive intensity in digital markets. The relevance of digital EI continues to grow as digital transformation disrupts traditional industries [40]. Individuals who effectively exploit digital platforms to design innovative business models are more likely to achieve long-term entrepreneurial success [40].

Earlier entrepreneurship studies identify internal determinants such as creativity, risk tolerance, opportunity sensitivity, leadership, and capability [41-43]. Additional psychological and behavioral drivers include entrepreneurial passion [44], creativity [45], locus of control [46], and self-efficacy [47].

External determinants encompass marital status, family and peer influence, religion, cultural norms, political environment, and institutional infrastructure [46, 48-50] conceptualized entrepreneurial competence as “underlying traits such as general and specific knowledge, objectives, traits, self-perceptions, social roles, and skills that lead to risk-taking, survival, and/or growth”. This view was later extended by [51] and [52], who included attitudes and behavioral norms essential for sustaining entrepreneurial success. Accordingly, the following hypothesis is proposed:

H3. Entrepreneurial competence positively influences entrepreneurial intention.

Digital entrepreneurship training, individual competency, and entrepreneurial intention: mediation model

Capability refers to the ability to effectively solve real-life problems and exploit opportunities [53, 54] argue that entrepreneurship contributes to societal development not only directly but also through the actions of entrepreneurial individuals. Entrepreneurial competence is defined as the cognitive orientation, skill set, and deep knowledge that allow individuals to identify opportunities, address challenges, and progressively develop them over time [16]. In this study, EC includes entrepreneurial skills, knowledge, and passion.

The aim of entrepreneurship education is to build entrepreneurial awareness, cognitive frameworks, thinking patterns, and practical abilities in learners [55, 56]. Prior studies suggest that entrepreneurship education remains largely theory-oriented, with learners primarily acquiring conceptual knowledge rather than experiential understanding [57]. However, training that emphasizes skill development plays a crucial role in enhancing individuals' readiness to initiate entrepreneurial ventures [54]. Entrepreneurship education can transmit theoretical knowledge and share successful experiences, thereby supporting the development of entrepreneurial skills and progress; however, practical skill acquisition is essential for strengthening overall competence and fostering innovative thinking (*ibid*). Participation in entrepreneurship competitions allows employees to gain direct experience that can support future venture creation. Research by [58] and [59] shows that entrepreneurial training provides time, platforms, facilities, tools, and funding opportunities, enabling individuals to develop and refine their capabilities.

[60] note that a strong understanding of the entrepreneurial mindset significantly shapes entrepreneurial intention, whereas entrepreneurial capability directly influences it. Based on this reasoning, the final hypothesis is proposed:

H4. Entrepreneurial competence mediates the relationship between entrepreneurship education and training and entrepreneurial intention.

Together, these four hypotheses form the conceptual framework of the study, illustrated in **Figure 1**.

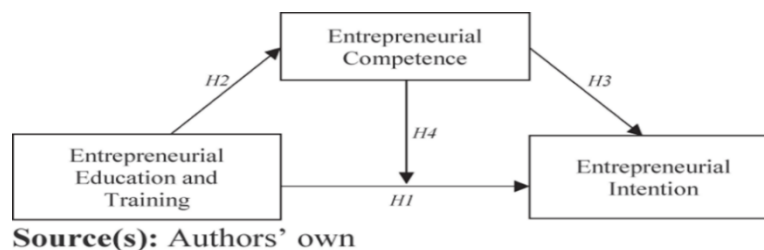


Figure 1. Theoretical model of this study.

Materials and Methods

This study examines how entrepreneurial education and training practices relate to entrepreneurial competence and entrepreneurial intention (EI) among employees working in IT and IT-enabled service firms in Delhi and the NCR region of India. The methodology section outlines the sampling design, data collection process, measurement of variables, and statistical techniques applied for hypothesis testing. Collecting responses from IT-sector employees provides meaningful evidence on how digital entrepreneurship education influences entrepreneurial outcomes within technology-driven environments.

A structured instrument containing 27 items was developed to measure three core constructs: digital entrepreneurship training (DET), entrepreneurial intention (EI), and entrepreneurial competence (EC). The independent construct, entrepreneurial education and training, is operationalized through four dimensions: training environment (TE), skill motives, professional ethics and values (PEV), and project-oriented training. The study includes two dependent constructs—entrepreneurial competence and entrepreneurial intention—which are both influenced by entrepreneurial education and training. Responses were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The conceptual model is illustrated in **Figure 2**. Ethical clearance and institutional research protocols were followed, and approval was obtained from the University of Delhi's Ethical Board.

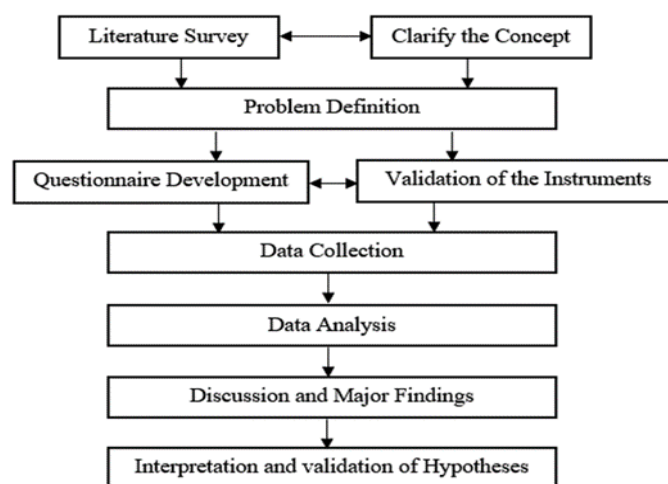


Figure 2. Proposed research framework of the study.

Data

The analysis relies on primary data collected directly from respondents. A structured questionnaire was designed for this purpose, drawing on previously validated instruments from earlier studies [31, 61, 62].

Sample and data collection

The research adopted a combination of non-probability sampling techniques, including random sampling and snowball sampling. Initially, questionnaires were distributed to 1,064 employees (810 via online channels and 254 through offline distribution) across Delhi and the NCR region, forming the total targeted population. Data collection was conducted over three months, from August 2021 to October 2021. A total of 434 completed responses were received. After data screening and refinement, 391 valid questionnaires were retained for final analysis.

Table 1 summarizes the demographic characteristics of the respondents. To ensure measurement validity, the questionnaire was first evaluated by academic experts and industry professionals. A pilot test involving 50 respondents was also conducted to assess instrument reliability and clarity.

Table 1. Sample profile of respondents (n = 391).

Variable	Description	Percentage	Frequency
Age	Below 21 years	18.7	73
	22–30 years	31.7	124
	31–45 years	30.7	120
	46–60 years	18.9	74
Gender	Male	71.6	280
	Female	28.4	111
Education level	Up to the matriculation level	6.6	26
	Up to the undergraduate level	17.6	69
	Postgraduate qualification	15.3	60
	Engineering and science background	31.5	123
	Diploma/ITI and other certifications	28.1	110
	Other qualifications	0.8	3
Availability of websites and accessibility within the organization	Always accessible	60.9	238
	Limited/restricted accessibility	22.3	87
	Not consistently accessible	16.9	66
Organizational promotion of digital entrepreneurial training and development	Yes	57.3	224
	No	42.7	167

Source(s): Authors' own work

Results and Discussion

Table 2 presents the distribution of entrepreneurial education and training programs undertaken by employees in IT and IT-enabled service organizations. The findings show that 231 respondents participated in social media marketing courses, 203 engaged in hands-on training such as Internet of Things applications, 185 completed digital marketing programs, 120 attended 3D printing technology courses, and 79 reported exposure to big data management training.

A chi-square test was conducted to examine whether participation in different entrepreneurial training courses varies significantly across education levels. The null hypothesis was that there were no significant differences in course participation across educational categories. The calculated chi-square value at 36 degrees of freedom and 5% significance level was 68.08, which exceeds the critical value of 55.76. Therefore, the null hypothesis is rejected, indicating that participation in entrepreneurial training differs significantly across respondents' education levels.

Table 2. Entrepreneurial training course across the level of education of respondents: cross-table analysis.

Category (Education level–based classification of respondents)	Training courses	Final responses	Total	Big data management	3D printing technology courses	x	MOOCs	Hands-on Internet of Things (IoT) courses	Social media marketing	Digital marketing training
Up to the matriculation level	Count	26	69	5	5	5	19	13	16	11
Up to graduation	Count	69	190	15	21	21	42	40	38	34

Postgraduate level	Count	60	165	12	17	17	38	32	38	28
Engineering and science background	Count	123	344	22	48	48	73	64	73	64
Diploma/ITI and other certification holders	Count	110	287	24	28	28	72	52	64	47
Other qualifications	Count	3	9	1	1	1	2	2	2	1
Overall total	Count	391	1064	79	120	120	246	203	231	185

Source(s): Authors' own work

Table 3 reports descriptive statistics, including means and standard deviations (S), for the entrepreneurial education and training dimensions, entrepreneurial competence, and entrepreneurial intention (EI). Among the training dimensions, project-oriented training recorded the highest mean score (3.6087) and the lowest standard deviation (0.94615). Reliability for this construct was $\alpha = 0.804$, composite reliability (CR) = 0.727, and average variance extracted (AVE) = 0.496789.

The next most prominent dimension was professional ethics and values (PEV), with a mean of 3.5209 and SD of 0.85672. Its reliability indicators were $\alpha = 0.739$, CR = 0.804, and AVE = 0.588. The training environment (TE) dimension showed a mean of 3.5045 and SD of 0.87054, with $\alpha = 0.660$, CR = 0.818, and AVE = 0.603. The skill motive dimension recorded a mean of 3.3229 and SD of 0.77592, with reliability values of $\alpha = 0.832$, CR = 0.887, and AVE = 0.663.

For entrepreneurial competence, the mean score was 3.6116 with a standard deviation of 0.53055. The reliability statistics were $\alpha = 0.774$, CR = 0.837, and AVE = 0.432. Finally, digital entrepreneurial intention (EI) recorded a mean of 3.4355 and SD of 0.49191, with reliability values of $\alpha = 0.887$, CR = 0.912, and AVE = 0.600.

Table 3. Factor of digital marketing, entrepreneurial competence, and entrepreneurial intention: descriptive statistics (n = 391).

Construct / Item	Std. deviation	Mean
Training environment ($\alpha = 0.660$, CR = 0.818, AVE = 0.603)	0.87054	3.5045
“Through active engagement with external stakeholders, my institution equips me for a digital profession”	1.09320	3.5652
“My institution provides internet access and mobile broadband services to support the creation of a digital entrepreneurial environment”	1.08456	3.1841
“My organization is increasing opportunities for digital start-ups”	1.04064	3.5934
Skill motivation ($\alpha = 0.832$, CR = 0.887, AVE = 0.663)	0.77592	3.3229
“The digital entrepreneurship training I received has improved my entrepreneurial skills”	1.09891	3.6317
“The digital entrepreneurship training I received has improved my communication abilities”	1.02752	3.6598
“The digital entrepreneurship training I received has improved my teamwork abilities”	1.03624	3.4501
“Digital entrepreneurship training prepares me for future readiness”	1.10960	3.2762
Professional ethics and values ($\alpha = 0.739$, CR = 0.804, AVE = 0.588)	0.85672	3.5209
“The digital entrepreneurship training I received has strengthened my lifelong learning and information management capacity”	1.08149	3.4041
“The digital entrepreneurship training I received has strengthened my critical thinking and problem-solving skills”	1.01238	3.5090
“The digital entrepreneurship training I received has strengthened my understanding of moral and professional ethics”	1.08249	3.6496
Project-oriented training ($\alpha = 0.804$, CR = 0.727, AVE = 0.496)	0.94615	3.6087
“I have started using digital tools to acquire entrepreneurial skills such as business feasibility analysis, market research, and business plan development”	1.20089	3.6368
“The digital entrepreneurship training I received has created new opportunities for me to develop innovative business models”	1.11899	3.5601
“The digital entrepreneurship training I received has helped me develop new business models, innovations, and value creation in data-driven sectors”	1.02435	3.6292
Entrepreneurial competence (measurement variable) ($\alpha = 0.774$, CR = 0.837, AVE = 0.432)	0.53055	3.6116
“I gain substantial knowledge from my digital entrepreneurship training curriculum”	0.83380	3.4604
“I am capable of adapting to new technologies during digital entrepreneurship training”	0.82774	3.5371
“I enjoy working in competitive situations involving others in digital entrepreneurship contexts”	0.86978	3.6803
“It is important for me to outperform others; winning matters in both work and games”	0.84141	3.8184
“I feel frustrated when others perform better than I do”	0.85325	3.7468
“I put extra effort when competing with others”	0.80493	3.6138
“I have prepared myself for future digital business challenges”	0.64753	3.4246
Digital entrepreneurial intention (measurement variable) ($\alpha = 0.887$, CR = 0.912, AVE = 0.600)	0.49191	3.4355
“I intend to establish my own business”	0.61621	3.4348
“I will definitely start my own business in the future”	0.62661	3.3913

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"I prefer being an internet entrepreneur over working for others"	0.54875	3.3376
"I want to launch my own business"	0.58226	3.3811
"After completing my studies, I plan to become a digital entrepreneur"	0.66882	3.4425
"I stay updated on successful tech entrepreneurs"	0.55112	3.4425
"After finishing my training, I intend to pursue a career in digital entrepreneurship"	0.84462	3.6189
Valid n (listwise)	—	—

Source(s): Authors' own work

Measurement model evaluation

To examine whether common method bias could distort the results, Harman's single-factor test was conducted [63]. The analysis showed that the extracted factor accounted for less than half of the total variance, suggesting that common method bias does not pose a serious issue in this dataset. A further concern in survey research is non-response bias; however, this risk was minimized because the majority of employees participated, and the use of face-to-face administration significantly reduced non-response-related problems.

Reliability analysis using Cronbach's alpha indicated that all constructs exceeded the minimum acceptable threshold of 0.6 and approached or surpassed the recommended level of 0.7 [64-68] (**Table 3**). Convergent validity was also confirmed, as AVE values ranged between 0.645 (behavioral intention) and 0.797 (perceived price value), demonstrating adequate internal consistency among items within each construct.

Factor loadings were assessed and found to be statistically significant, with most values equal to or above 0.5 and preferably exceeding 0.7 [69-73]. As reported in **Table 3**, all indicators loaded above 0.5 on their respective constructs. In addition, discriminant validity was supported, as each construct's AVE was above zero and item correlations were stronger within constructs than across constructs, confirming adequate separation between variables.

Structural model and hypothesis testing

The structural model was evaluated using the Variance Inflation Factor (VIF), coefficient of determination (R^2), and standardized path coefficients [74]. All VIF values were above 1.0, with the highest at 2.095, which remains within the acceptable threshold of 3.0 (**Table 4**). This indicates that multicollinearity is not present in the model.

The model's explanatory power was assessed using R^2 values. The link between entrepreneurial education and training and entrepreneurial intention (EI) yielded an R^2 of 0.778, indicating that 77.8% of the variance in EI is explained by the model's predictors. All standardized path coefficients were significant at the 0.01 level, indicating strong statistical relationships and supporting the overall model's adequacy.

Table 5 provides the estimated path coefficients and significance values for all hypotheses. Hypothesis H1 proposes a direct effect between entrepreneurial education and training and entrepreneurial intention. The estimated relationship ($\beta = 0.312$, $P < 0.001$, $t = 12.123$, $P = 0.00$, $VIF = 2.095$, $R^2 = 0.778$) was found to be statistically significant.

Table 4. Discriminate validity.

Variables	Training environment	Skill motives	Project orientation training	Professional ethics and values	Entrepreneurial education and training	Entrepreneurial competence	Entrepreneurial intention
Entrepreneurial intention							0.775
Entrepreneurial competence						0.657	0.856
Entrepreneurial education and training					0.418	0.723	0.768
Professional ethics and values				0.767	0.073	0.061	0.006
Project-oriented training			0.705	0.555	0.144	0.070	0.102
Skill motivation		0.814	-0.008	-0.039	0.541	0.156	0.117
Training environment	0.776	0.150	0.112	0.044	0.910	0.773	0.846

Note(s): Diagonal values represent the square root of AVEs, while off-diagonal values represent squared correlations between constructs
Source(s): Authors' own work

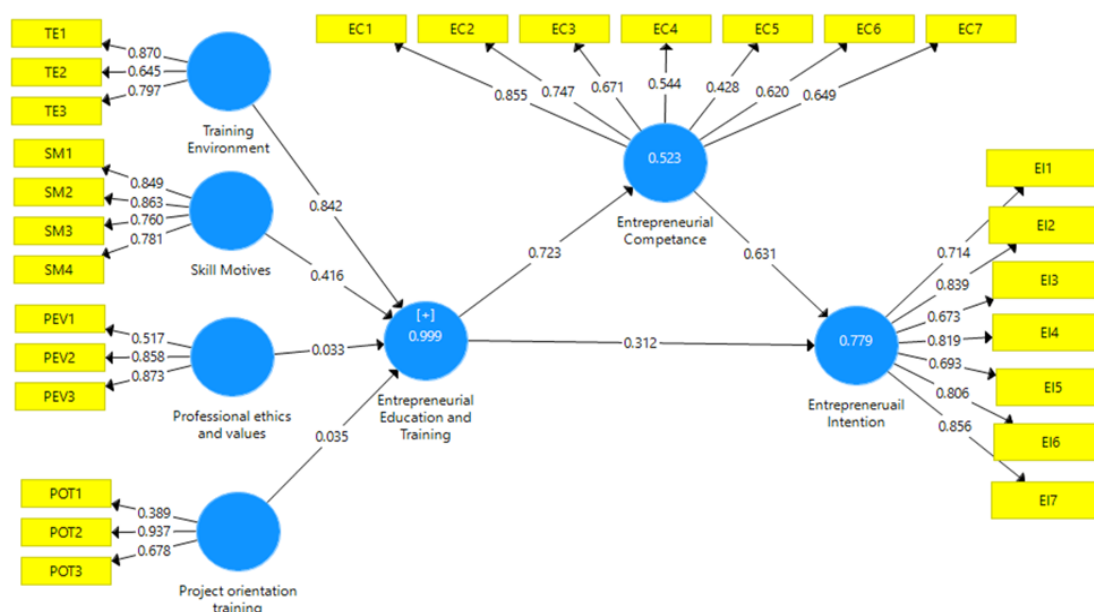
Table 5. Path coefficients and P-values.

Hypothesized relationship	Result	VIF	p-value	t-value	R ²	Path coefficient
Entrepreneurial education and training → Entrepreneurial intention	Accepted	2.095	0.000	12.123	0.778	0.312
Entrepreneurial education and training → Entrepreneurial competence	Accepted	1.000	0.000	15.007	0.522	0.723
Entrepreneurial competence → Entrepreneurial intention	Accepted	2.095	0.000	11.234	0.999	0.631

Source(s): Calculated from primary data

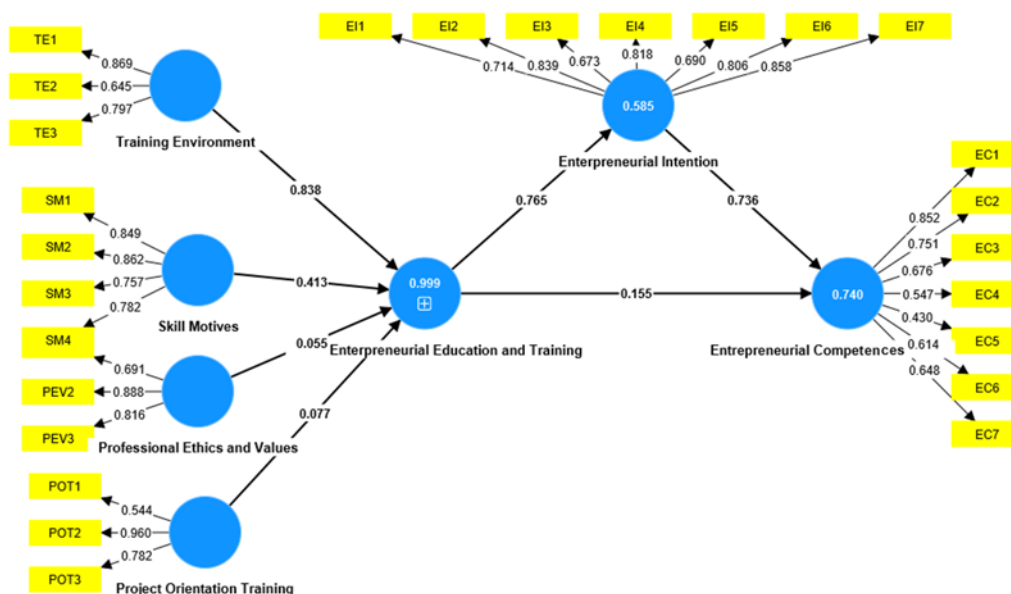
In line with the interpretation, entrepreneurial education and training significantly affect entrepreneurial intention, thus supporting H1. For H2, it was proposed that entrepreneurial education and training positively influence entrepreneurial competence. The results confirm this relationship ($\beta = 0.723$, $t = 15.007$, $P = 0.00$, $VIF = 1.00$, $R^2 = 0.522$), leading to acceptance of H2. Regarding H3, entrepreneurial competence was hypothesized to influence entrepreneurial intention, and this hypothesis was supported by a significant coefficient ($\beta = 0.631$, $t = 11.234$, $P = 0.000$).

The final structural and measurement models are illustrated in **Figures 3 and 4**.



Source(s): Authors' own

Figure 3. Structural equation model indicating the relations among entrepreneurial education and training, entrepreneurial competence, and entrepreneurial intention, with standardized path coefficients.



Source(s): Authors' own

Figure 4. Relationship between entrepreneurial education and training and entrepreneurial competence, with entrepreneurial intention mediating, using standardized path coefficients (as reviewers suggested to develop this relationship).

Mediating effect

The mediation analysis assumes that entrepreneurial education and training must first show a significant positive association with entrepreneurial intention. Several steps were followed to determine the mediation type in the model. Results in **Table 5** confirm that entrepreneurial competence is significantly related to both entrepreneurial education and training and entrepreneurial intention ($P > 0.01$). Accordingly, hypotheses H1, H2, and H3 are supported.

The mediation test was conducted using the procedure developed by [75]. Their approach specifies that mediation is established when the indirect effect is statistically significant and the confidence interval does not include zero. As shown in **Table 5**, the indirect effects involving entrepreneurial competence are significant, as their confidence intervals do not include zero.

These findings confirm that H4—stating that entrepreneurial competence mediates the relationship between entrepreneurial education and training and entrepreneurial intention—is supported. The mediation effect is positive and statistically significant (**Table 6; Figure 3**).

Table 6. Direct and indirect effect analysis.

	P- values	T statistics (O/STDEV)	Standard deviation (STDEV)	Sample mean (M)	Original sample (O)
Entrepreneurial competence → entrepreneurial intention	0.000	11.257	0.056	0.655	0.631
Entrepreneurial education and training → entrepreneurial intention	0.000	4.546	0.069	0.285	0.312
Entrepreneurial education and training → entrepreneurial competence	0.000	7.590	0.095	0.694	0.723

Source(s): Authors' own work

The results of this study provide empirical support for all proposed hypotheses. Specifically, hypotheses H1, H2, and H3 confirm that entrepreneurial education and training positively affect both entrepreneurial competence and entrepreneurial intention (EI). These findings are consistent with, yet also extend, the work of [76] and [77], who demonstrated that training environment (TE) and the development of skill motives significantly enhance entrepreneurial education and training outcomes. In comparison, this study further shows that these dimensions contribute more strongly to entrepreneurial capability and EI than professional ethics and values (PEV) and project-oriented training components.

Moreover, the findings broaden earlier research that primarily focused on entrepreneurship education at the secondary school level [78, 79]. In contrast, this study offers evidence from organizational employees, thereby contributing new insights into the development of an inclusive philosophy of entrepreneurship education and training [9, 80].

The empirical results indicate that entrepreneurship training programs implemented within organizations can effectively develop employees' entrepreneurial skills, motivation, and positive attitudes. As highlighted by [81], dynamic self-driven competencies can be gradually acquired and strengthened over time through practical exposure, training activities, and real experience. In line with social cognitive theory, entrepreneurial training enhances employee motivation, engagement, and entrepreneurial awareness—even among secondary school learners—particularly when active, experiential learning methods are applied [76].

Furthermore, both experiential and passive learning approaches in entrepreneurship education contribute to improving employees' entrepreneurial self-efficacy. Activities such as report writing, presentations, teamwork exercises, and internships support skill development by facilitating mastery learning. Experiential components are especially effective because they incorporate key elements of modeling and guided practice. The effectiveness of youth-oriented entrepreneurship training programs largely depends on the nature of learning activities embedded within them, where experiential learning plays a central role in developing practical competencies such as opportunity evaluation, judgment, and environmental scanning. In addition, field visits to firms and interactions with business leaders help employees form more realistic perceptions of entrepreneurial practice.

According to [41] and [42], key attributes such as creativity, risk tolerance, opportunity responsiveness, leadership, and capability are essential for entrepreneurial success and business growth. Entrepreneurs are expected to generate innovative ideas and develop original approaches [45]. Creativity enables them to distinguish their products and services, identify new opportunities, and outperform competitors. This involves independent thinking, openness to new perspectives, and challenging conventional assumptions [45].

Risk-taking is a core element of entrepreneurial behavior [42]. Successful entrepreneurs tend to be comfortable with uncertainty and are willing to take calculated risks. Although they acknowledge the possibility of failure, they interpret it as a valuable learning experience. Through this process, entrepreneurs develop greater risk tolerance, which enhances their ability to pursue opportunities and overcome challenges [41].

Additionally, entrepreneurs must be able to identify and leverage market opportunities effectively. To increase the likelihood of success, they must efficiently utilize available resources such as capital, human talent, networks, technology, and other strategic assets [42]. Effective resource utilization enables entrepreneurs to scale their ventures and capitalize on emerging opportunities.

Despite the importance of these five core elements, entrepreneurship remains a complex and multidimensional phenomenon. Long-term entrepreneurial success is also influenced by additional factors such as persistence, adaptability, industry knowledge, and passion for one's work. Furthermore, external conditions such as market dynamics, competitive pressure, and regulatory environments can also significantly shape entrepreneurial outcomes.

To start with, this research is among the early studies to investigate multiple forms of entrepreneurial education and training and their effects on entrepreneurial intention (EI) among employees working in industrial training institutes (ITs) and IT-enabled service organizations. In doing so, it contributes to the literature by integrating entrepreneurial education and training with entrepreneurial competence development and by emphasizing the mediating function of entrepreneurial competence in explaining the link between entrepreneurial education and training practices and entrepreneurial intention among IT and IT-enabled service employees.

From an applied perspective, the findings offer useful implications for policymakers, industry practitioners, and entrepreneurial support organizations in developing a more effective entrepreneurial ecosystem. The evidence suggests that individuals can acquire the relevant knowledge, competencies, and behavioral orientations required for digital entrepreneurship through structured education and training. This, in turn, can support the creation of new digital ventures that contribute to economic development and employment generation.

At the policy level, increasing attention is being directed toward strengthening digital entrepreneurship education and its outcomes. Governments and relevant agencies are increasingly investing in initiatives such as funding entrepreneurship education in academic institutions, establishing incubators and accelerators for digital start-ups, and offering tax benefits to digital entrepreneurs. There is also growing recognition of the importance of enhancing individuals' willingness to engage in digital entrepreneurial activity. This includes facilitating access to finance, mentoring support, and professional networks for aspiring entrepreneurs. Furthermore, regulatory simplification and improved access to infrastructure and resources can create an enabling environment for innovation and venture creation.

In this regard, digital entrepreneurship education and digital entrepreneurial intention carry important theoretical and policy implications. Strengthening educational systems and encouraging entrepreneurial intentions can help build a more robust, evolving digital entrepreneurship ecosystem that supports innovation, employment, and economic expansion. Additionally, policymakers may consider integrating entrepreneurship education as a mandatory component across higher education programs, ensuring that students from diverse disciplines acquire essential entrepreneurial knowledge and skills. Financial institutions such as angel investors, venture capitalists, and banks can also benefit from this study by using its insights to evaluate investment potential, identify viable opportunities, and assess future entrepreneurial growth prospects.

Research in entrepreneurship and enterprise education also contributes meaningfully to the broader field of entrepreneurship. Conducting studies in this area strengthens the field's relevance and highlights its importance [82]. Such research enriches existing knowledge by introducing new theoretical perspectives, conceptual models, and analytical frameworks [83]. This study enhances understanding of how entrepreneurship education influences entrepreneurial behavior, intention, and success outcomes [84].

Moreover, it provides deeper insight into the mechanisms and processes underlying entrepreneurial learning and capability development, while extending the findings of [85], who identified effective practices in entrepreneurship education, including pedagogical design, curriculum structure, experiential learning methods, and mentoring systems. These insights can guide educators, policymakers, and program designers in improving the design and relevance of entrepreneurship education initiatives. For both researchers and practitioners, understanding the relationship between entrepreneurship education and entrepreneurial outcomes remains essential [86].

In addition, this study supports the evaluation of the effectiveness of entrepreneurship education in promoting entrepreneurial intention, venture creation, innovation, and overall entrepreneurial success [87]. Such findings can help stakeholders design more targeted and impactful educational programs that enhance outcomes at individual, organizational, and societal levels [88]. Furthermore, research in this area helps identify weaknesses and limitations in existing entrepreneurship education systems, uncover barriers to participation and success, and suggest ways to address them. By closing these gaps, more inclusive and equitable entrepreneurial ecosystems can be developed. Overall, findings from entrepreneurship education research are valuable for policymakers, educators, and practitioners engaged in entrepreneurial development [86].

Conclusion

This study examined the role of digital entrepreneurial education and training in enhancing entrepreneurial competence and entrepreneurial intention (EI), and the mediating effect of entrepreneurial competence on the relationship between

entrepreneurial education and training practices and EI. The results indicate that entrepreneurial education and training positively influence both entrepreneurial competence and entrepreneurial intention. The study is intended to support managers in fostering the development of more digital entrepreneurs in the digital economy by strengthening employees' entrepreneurial skills, motivation, and positive attitudes within organizations.

This research has two key limitations that also offer directions for future studies. First, the results may have limited generalizability, as the sample is restricted to a specific geographic region, educational background, and organizational or cultural context. In addition, the relationship between training and intention may be influenced by other contextual or psychological factors such as self-efficacy, perceived social support, or entrepreneurial knowledge, which may differ across settings. Second, the study primarily focuses on the short-term impact of digital entrepreneurship training on entrepreneurial intention and does not fully capture long-term effects on entrepreneurial behavior and sustained venture success.

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