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Article

From Classroom to Enterprise: How Entrepreneurial Education Shapes Learning Outcomes through Self-Efficacy

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Abstract

The purpose of this study was to examine the impact of entrepreneurial education (EE) on entrepreneurial learning outcomes (ELO) among university students, while investigating the mediating role of entrepreneurial self-efficacy (ESE) and the moderating role of the learning environment (LE). The study aimed to provide a comprehensive understanding of how educational, psychological, and contextual factors interact to enhance entrepreneurial learning. A quantitative, cross-sectional research design was adopted, and data were collected from 237 university students enrolled in entrepreneurship-related programs at Saudi universities. Well-established and validated instruments were used to measure EE, LO, SE, and LE. SmartPLS 4 was employed for data analysis to assess the measurement and structural models, ensuring the reliability and validity of the constructs and testing the hypothesized relationships. The results revealed that EE significantly and positively influences ELO and ESE. ESE was found to mediate the relationship between EE and learning outcomes. Furthermore, the LE significantly moderated the relationship between EE and ESE, indicating that supportive environments amplify the educational impact. This study contributes to entrepreneurship education literature by integrating social cognitive theory (SCT) and experiential learning theory (ELT) to explain how education enhances learning through ESE and contextual support. The findings offer practical implications for designing entrepreneurship programs that combine experiential learning with supportive educational environments.

Keywords

Entrepreneurial Education, Entrepreneurial Learning Outcomes, Entrepreneurial Self-Efficacy, Learning Environment, Experiential Learning Theory.

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Introduction

EE has become an important field in modern systems of higher education, especially because it contributes to innovation, economic development, and job creation in developed and developing states. The growing worldwide recognition of the entrepreneurial ecosystem has placed universities in the strategic role of developing entrepreneurial minds, innovation, and risk-taking skills in learners (Sitaridis & Kitsios, 2023). Over the past few years, EE has found its way into the curriculum of the universities to equip them with skills, attitudes, and competencies required to generate ventures and innovations (Saoula et al., 2023).

EE should not only impart the knowledge about the business but enhance the problem-solving, leadership, and opportunity recognition abilities that will result in the further increase of the economic growth and social growth (Wang et al., 2023). Also, the concept of ELO has gained the center of interest as a multidimensional phenomenon that encompasses both cognitive, affective, and behavioral endeavors as the product of the entrepreneurship learning (Choshi, 2025). This new area of research has highlighted the transformational aspect of education in the creation of future entrepreneurs who will be able to survive in the unpredictable and volatile business environment.

Empirical studies have given significant results indicating that EE is related to numerous positive results including entrepreneurial intention, ESE, opportunity recognition, and venture readiness (Taneja, Kiran, & Bose, 2023). Literature has continuously indicated that the exposure to the entrepreneurship course and entrepreneurship training program has a significant positive impact on the confidence in entrepreneurship skills and motivation among the students to engage in entrepreneurial careers. The studies in various ELEs have also revealed that experience-based and practical learning experiences like business simulation, incubator programs, and mentorship programs result in higher entrepreneurial qualities as opposed to the conventional lecture-based models (Taneja et al., 2023).

Moreover, meta-analytic literature demonstrates that the effect of EE is not universal but rather depends on such aspects as the teaching pedagogy, the time taught, and cultural background (Pham & Le, 2023). Nevertheless, the general empirical evidence find a way to agree that EE is a form of developmental aid that can help improve SE and learning scores of the students (Wardana et al., 2024). The above evidence supports the significance of EE as an important source of human capital formation and entrepreneurial performance in various educational environments.

Despite the contribution of the previous researches, there are several gaps that have not been inspected in the current literature. To begin with, much of the empirical research has put more emphasis on business intentions as an outcome measure with little emphasis on entrepreneurial learning outcomes that bring into focus the holistic learning experiences that come with the EE (He et al., 2024). Second, we do not have sufficient knowledge of psychological processes involving how EE impacts learning outcomes, and specifically, the mediating effect of ESE (Miço & Cungu, 2023).

Although SE has been cited as one of the determinants on the entrepreneurial behavior, its role as a mediating factor between educational experiences and the real learning outcomes is not well studied (Pham & Le, 2023). Third, relatively little attention has been given to contextual factors, i.e. the LE, which can determine the intensity and the orientation of the educational effects. The relationship between EE and SE has been investigated in few studies that have empirically studied the relationship with institutional support, resource availability and peer collaboration to moderate the relationship (Madawala, Foroudi, & Palazzo, 2023). These gaps need to be filled so as to come up with a more holistic picture of the way EE leads to effective learning and behavior change among students.

Literature Review

EE has acquired growing academic interest as an imperative driver of innovation, employability and economic growth in developed and developing economies. As is well known, it is a systematic strategy that incorporates pedagogical, learning through experience, and actual exposure to instil entrepreneurial awareness, skills, and intentions in the student (Xin & Ma, 2023). According to the scholars, EE does not only equip a person with theoretical skills related to the creation and management of businesses but it also trains them to think critically, be creative, and identify opportunities (Manafe et al., 2023). Students can apply abstract concepts into

practice through experiential learning experiences including business simulations, start-up incubators, and project-based courses and improve their ESE (Alshammari et al., 2025). This type of education fosters the psychological qualities that make one an entrepreneur such as a tendency to take risks, resilience and innovative reasoning (Hardini, Khaizure, & Godwin, 2024). In addition, research has established that in cases where learning institutions focus on the interactive and problem based learning, students acquire a better entrepreneurial mind-set, which contributes positively to their entrepreneurial career attitudes (Miço & Cungu, 2023). In its turn, the EE can be viewed as a transformative learning process, which alters the perception of students, their abilities, and the intent to behave in a way that would allow them to venture into the entrepreneurial activities.

EE is frequently considered to be effective by means of ELO which are the cognitive, affective and behavioral aspects of learning. These results indicate how well students absorb the entrepreneurial knowledge and acquire skills related to it, as well as display the willingness to work in the world of entrepreneurship (Msambwa, Wen, & Daniel, 2025). It has been found that when properly designed entrepreneurial programs are offered, it can largely improve the learning outcomes by integrating the theoretical and practical knowledge in the programs, encouraging teamwork, and providing mentorship to young entrepreneurs by seasoned entrepreneurs (Al Issa, Thai, & Saad, 2025).

The learning outcomes can be further enhanced by the fact that education systems have embraced constructivist and experiential learning theories that have enabled students to learn by engaging in active learning and reflection of real entrepreneurial challenges (Lehane, 2025). Also, the joint implementation of interdisciplinary courses, digital technologies, and entrepreneurial environments in universities increases the exposure of students to dynamic market conditions and problem-solving situations (Gusma et al., 2025). Finally, the ELO would help in the generation of human capital that is competent in the process of spurring innovation, keeping business ventures alive and adding to the socio-economic growth.

Hypotheses Development

EE is the articulate collection of curricular and after school learning experiences that are deliberately created to enhance the learning of knowledge, skills, attitude and disposition of the learner pertaining to the creation, assessment, and administration of new enterprises. It includes formal education (theory of entrepreneurship, business planning, finance), pedagogical strategies (problem-based learning, project-based learning, case studies) and experience (incubators, internship, business simulation, startup projects, mentorship and networking opportunities) (Sitaridis & Kitsios, 2023). The measurable cognitive, affective, and behavioral changes, which are as a result of these educational inputs, are ELO (Saoula et al., 2023).

At the cognitive level, domain-specific outcomes are domain-specific knowledge, including opportunity recognition, market analysis, and business model design, affective outcomes include such constructs as ESE, risk tolerance, resilience, and motivation, and behavioral outcomes include such practical capabilities as pitching, resource mobilization, team leadership, and actual entrepreneurial action or intentions to start a business (Adeel, Daniel, & Botelho, 2023; Wang et al., 2023). Combined, these variables are working on various levels (individual competence, intention, and enacted behavior) and are usually measured by using a complex of psychometric scales, performance tasks, and observing signs of entrepreneurship activity (He et al., 2024).

There is a considerable empirical research on the relationship between various EE configurations and learning outcomes, with the results providing largely positive but subtle results (Motta & Galina, 2023). Literature indicates that programs with greater emphasis on experiential learning, i.e. hands-on projects, incubators, and mentorship, result in bigger increases in SE, opportunity recognition and practical skills compared to traditional lecture based courses (Msambwa et al., 2025). This is usually revealed in meta-analytic and longitudinal studies that intensive and applied interventions enhance the entrepreneurial intentions and perceived preparedness of students, though the transfer to venture creation is less predictable and varies by time of follow-up and contextual facilitating factors (Pham & Le, 2023).

Other studies point to such critical boundary factors: the duration and intensity of the program, knowledge of the instructor, exposure to entrepreneurial ecosystems and pre-existing experience of students partially mediate the size of returns (Choshi, 2025). There is also heterogeneity in measurement: there are studies that define attitudinal change, others the learning of skills or other behavioral outcomes which account of differences in reported effect sizes (Hardini et al., 2024). A subdivision of the study offers warning bells, establishing short-term attitudinal improvements that fizzle over time without the presence of a supportive

environment or structural possibility to put into action learned abilities, highlighting the importance of institutional and environmental accommodations in solidifying learning into entrepreneurial action.

H1: *EE positively influences ELO.*

EE is a formal and deliberate process of cultivating entrepreneurial potentials in individuals that integrates both the theoretical and experiential learning processes; business simulations, case studies, startup projects and mentorship (Taneja et al., 2023). It is based on the development of various cognitive, affective, and behavioral skills that improve the opportunities of students to recognize opportunities, deal with risk, and generate value in the form of innovation (Al Issa et al., 2025). On the other hand, ESE is the belief of a person that he/she is capable of performing entrepreneurial activities successfully which include opportunity recognizing, mobilizing resources, innovating as well as managing the venture under consideration (Miço & Cungu, 2023). Based on the SCT proposed by Bandura (2001), the SE is an important motivational construct that affects entrepreneurial behavior by defining the way people think, feel, and behave in response to entrepreneurial challenges. Within the educational setting, ESE will be grown by exposing learners to mastery experiences, learning vicariously through role models, and social persuasion which are the perquisites of effective EE programs (Christensen et al., 2023).

Empirical studies have invariably revealed that EE has a robust and positive effect on ESE in a wide variety of educational and cultural situations. As an instance, students attending entrepreneurship programs tend to say that they feel more confident about their entrepreneurial skills than students who did not get the training (Le, Doan, & Duong, 2023). Research has indicated that entrepreneurship courses that focus on experiential and action learning are highly relevant in enhancing self-confidence by the students regarding their ability to initiate and maintain a business (Al Issa et al., 2025).

European, Asian, and North American evidence also endorses the idea that in the event that students undergo real-world experiences in entrepreneurship, including writing a business plan, pitching to investors, or startup contests, the level of SE increases because of the mastery experience reinforcement (Adigun, Mpofu, & Maphalala, 2025). The longitudinal studies also indicate that SE growth can be maintained with the exposure to the EE and it does not just affect the entrepreneurial intentions of the students but also the entrepreneurial activities that the students are engaged in after the schools (Chahal, Shoukat, & Ayoubi, 2023). On the other hand, less practical programs based on traditional lectures demonstrate lower impacts implying that the pedagogical model of entrepreneurship learning is a key factor influencing SE.

H2: *EE positively influences ESE.*

Studies of EE are showing an increasing empirical evidence on the role of psychological mechanisms to elucidate the way in which learning experiences are converted into measurable outcomes (Manafe et al., 2023; Saoula et al., 2023). One of these mechanisms has been SE as a key explanatory variable. The research has indicated that EE increases self-beliefs by mastery experience, vicarious learning and social reinforcement which in turn determine the degree to which students learn and apply entrepreneurial knowledge and skills. When learners become more confident in their entrepreneurial ability, they are more involved in the learning process, will not give up during hardships, and will take risks to explore new ideas (Madawala et al., 2023). Studies carried out in both developed and developing settings have always concluded that high self-belief has the effect of increasing knowledge retention, application of skills and intention to act on entrepreneurial action (Taneja et al., 2023). It can be argued that such an indirect relationship might be the result of education and learning outcomes acting via SE since it allows learners to convert educational exposure into substantial competence and behavior (Christensen et al., 2023).

A number of empirical studies prove the mediational role of SE in the relationship of educational interventions and learning outcomes. Indicatively, in studies on experiential entrepreneurship programs, confidence in entrepreneurial competence of students tends to mediate the influence of course design on development of opportunity recognition, creativity and business management capabilities (Wardana et al., 2024). The same results have been reported in the studies based on project-based or simulation-based learning where SE increase comes before any enhancement of knowledge and application of the entrepreneurial knowledge. The results of meta-analysis of EE support further that SE is a required psychological interface between educational exposure and learning efficacy. Learners who have internalized a feeling of competence tend more to practice in

a reflective manner, be proactive and transfer theoretical ideas to practice.
H3: *ESE mediates the relationship between EE and ELO.*

The increasing literature also highlights that EE is context-dependent at best (especially the LE in which the education is offered) (Herman et al., 2025). Physical, psychological, and social environment that facilitates or limits educational experiences of students is known as the LE (Motta & Galina, 2023). It incorporates elements of institutional support, design of institution, access to resources, collaboration with peers, mentorship, and a culture of innovation and experimentation in general (Alshammari et al., 2025). An encouraging environment leads to an open mind to take risks, creativity and self-directed learning, which is paramount in development of entrepreneurial confidence (Pham & Le, 2023). On the other hand, inflexible or unsympathetic educational backgrounds provide fewer chances of experiencing entrepreneurial activity and lower the motivational effectiveness of entrepreneurial training (Gusma et al., 2025). Therefore, although EE offers the content and pedagogical basis, the LE has an influence on how much students can take meaningful engagement and internalize such encounter (Al Issa et al., 2025).

Empirical research indicates high levels of evidence of the importance of variation of LEs in determining the outcomes of EE. To provide an example, a study of the students of the universities with well-developed entrepreneurship ecosystems (compared to those in the less supportive institutions) reveals that the former exhibits greater rates of entrepreneurial confidence, motivation, and willingness to take action (Hui, 2024). Availability of business incubators, exposure to entrepreneurial role models, and participatory teaching styles are some of the factors that increase the sense of efficacy amongst students through availing them a chance to practice and learn socially (Adigun et al., 2025). The research has also shown that mentorship and collaboration among peers have positive impacts to the belief that learners have on their entrepreneurial capabilities through the feedback, encouragement and real-life experiences (Taneja et al., 2023). Conversely, with competitive environment, disincentive to innovations, or deficient in experiential elements, the beneficial impacts of EE to the confidence levels of students are likely to be diluted. This implies that the quality and LE structure are boundary conditions of how well education can improve ESE.
H4: *LE moderates the relationship between EE and ESE.*

Theoretical Framework Supporting the Research

The relationships proposed in this research model is theoretically grounded in SCT (Bandura, 2001) and ELT (Kolb, 2014), both of which explain how individuals acquire and translate learning experiences into self-beliefs and behavioral outcomes. SCT assumes that learning takes place through the interrelationship of individual, environmental and behavioral variables with SE playing a key role of mediating between educational experiences and performance outcome (Bandura, 2001). In the EE environment, the theory shows the development of ESE in students due to mastery experiences, vicarious learning of entrepreneurial role models and social persuasion against a supportive educational environment (Saoula et al., 2023). The theory of experiential learning supplements this theory because it highlights the fact that new knowledge is developed through the processing of experience, where the learner actively participates, reflects on, conceptualizes and tries the unfamiliar (Grant, 2025).

EE with some experiential elements including simulations, business plan development, and mentorship offers the context in which the students can exercise and refine their entrepreneurial potential, which strengthens their confidence and translates into better learning results. Moreover, the SCT can also be used to explain the moderating role played by the LE in that the enablers of the environment, including institutional culture, resources, and peer support, impact the efficacy of learning experiences. Where LE promotes collaboration, innovation and autonomy, it enhances the positive outcomes of EE on self efficacy and further learning results. Therefore, the combination of these theoretical views provides a detailed explanation of how EE directly and indirectly improves the outcomes of learning in terms of SE, and how such a connection is reinforced in a conducive learning atmosphere. The hypothesis of the relationships between the study variables and is depicted in the conceptual framework (Figure 1). This is because EE is the independent variable that affects entrepreneurial learning results as the dependent variable. ESE is a mediating variable that underlies the process by which education contributes to learning outcomes whereas the LE is a moderating variable that enhances the association between EE and ESE.

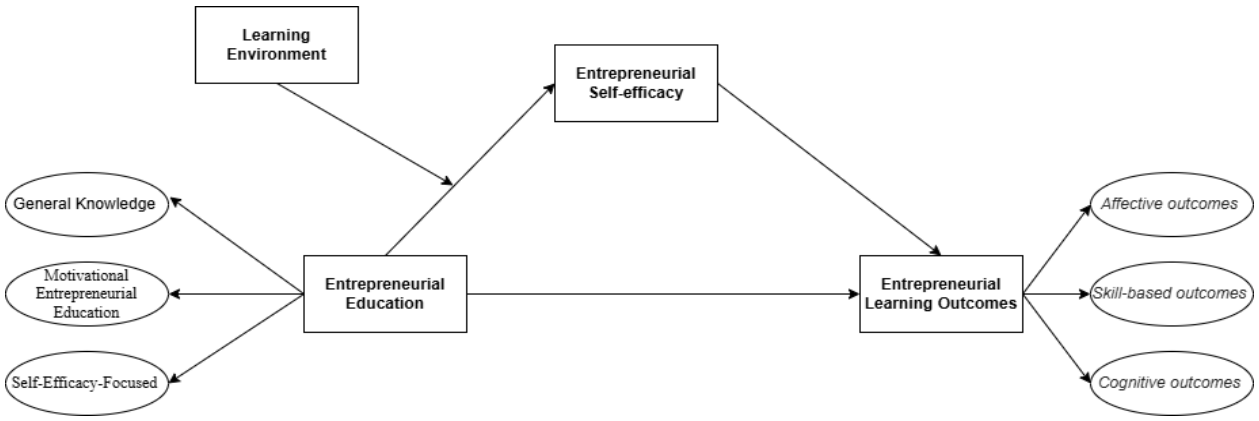

Figure 1: *Conceptual Framework.*

Methodology

The current research used a cross-sectional quantitative research design in order to examine the effects of EE on the ELO with ESE acting as a mediator variable and LE as a moderating variable. The design was chosen so that it could be possible to examine the relationship between constructs in a single time frame with the help of empirical data. The research was intended to give a statistically based insight into the impact of EE on the learning outcomes and psychological empowerment of students in institutions of higher learning.

The sample population to be used was the population of university undergraduates studying entrepreneurship and business in various institutions of higher learning in KSA. The sample population comprised of 237 students that were a good sample size of students representing different areas of study, and who had an established EE in the curriculum. It was found that the sample size was adequate since it is recommended in structural equation modeling (Hair et al., 2021), and it offers statistical power in estimating models and testing hypotheses. The non-probability purposive sampling technique was employed that is, only respondents who had attended at least one of the entrepreneurship classes/training modules were incorporated. This was an inclusion criterion that ensured that the participants were relevant in their exposure to learning experiences that were under investigation. The demographic information of the surveyed people, such as gender, age, major and previous entrepreneurial experience was also observed to give context to the analysis, however they were not significant hypotheses.

In the study, standardized and validated scales which were revised in accordance with past studies have been utilized to ascertain reliability and construct validity. The scale to evaluate EE was properly adapted to the scale developed by Silva et al. (2021) describing the various aspects of EE including motivational and SE-focused. The construct comprised a number of items that were rated on a five point Likert scale with 1 (strongly disagree) and 5 (strongly agree) being the left and right ends respectively. The instrument of Kozlinska, Rebmann and Mets (2020) was adopted to assess the ELO regarding the cognitive dimension, affective dimension, and skills-based dimension of entrepreneurial learning gained during the process of EE. The scale that measures ESE was the already tested scale of Asimakopoulos, Hernández and Peña Miguel (2019) that was to measure the confidence of the people in the ability to perform the entrepreneurial tasks such as opportunity recognition, innovation, and risk management. LE was rated in comparison to the scale that was created by Fraser (2023) that gauges the perception of the students with regard to the environment of education which consisted of teacher support, collaboration, autonomy, and availability of resources. Every single item was sized to suit itself into the existing situation, and pilot testing was carried out to achieve as clear with linguistic clarity and relevancy of concepts.

The collected data were gathered in a structured self-administered questionnaire and available online and face-to-face. The participants were made aware of the reason why the research was conducted and they were asked to answer the statements to their level best. The questionnaire was made to be short, easy to understand, and logically structured to ensure the respondent interest and reduce possible bias of the respondents. A pilot study was carried out before the actual data collection to test the internal consistency of the scales and to make the questionnaire easier to understand. The data were screened to remove missing data and inconsistent entries and the final dataset comprised 237 valid responses.

The analysis of the data was conducted in SmartPLS version 4, which is a structure equation modeling (SEM) tool based on variance, which is appropriate in predictive research and theory testing. SmartPLS was selected because it is more powerful to address complicated models, smaller sample sizes, and non-normal data distributions (Hair et al., 2021). It was analyzed in two steps, the measurement model, and the structural model test. The reliability and validity of constructs were tested in the initial phase involving Cronbach alpha, composite reliability (CR) as well as average variance extracted (AVE) as indicators. The convergence and discriminant validity were measured using Heterotrait–Monotrait criteria. In the second step, path coefficients, t-values and p-values based on bootstrapping with 5,000 resamples were used to test the hypothesized relationships. The overall model fit and predictive strength were assessed using the coefficient of determination (R2), predictive relevance (Q2), as well as standardized root mean square residual (SRMR). SmartPLS was also used to test the mediating effect of ESE and moderating role of the LE with the specific bootstrapping procedures of indirect and interaction effects.

Results

Table 1 presents the results of the construct reliability and validity assessment for all study variables, confirming that the measurement model (Figure 2) demonstrates strong reliability and convergent validity. All constructs show Cronbach's alpha and composite reliability (CR) values exceeding the acceptable threshold of 0.70, indicating internal consistency among items. The average variance extracted (AVE) values for each construct are above the minimum acceptable value of 0.50, demonstrating that each construct explains more than 50 percent of the variance in its observed indicators. Specifically, affective outcomes recorded high reliability with Cronbach's alpha of 0.894 and CR of 0.917, while AVE was 0.614, suggesting good convergent validity. Similarly, cognitive outcomes also demonstrated satisfactory reliability (α = 0.875, CR = 0.903, AVE = 0.572), confirming the construct's internal coherence. ESE (α = 0.765, CR = 0.855, AVE = 0.577) and general knowledge (α = 0.893, CR = 0.916, AVE = 0.610) both met the reliability benchmarks, affirming their measurement stability. The LE variable achieved particularly high reliability (α = 0.914, CR = 0.905), with an AVE value of 0.516, reflecting a well-defined construct supported by 15 indicators. Motivational EE also displayed robust reliability (α = 0.882, CR = 0.915, AVE = 0.685), while skill-based outcomes (α = 0.915, CR = 0.929, AVE = 0.547) confirmed adequate internal consistency despite a broader range of indicators. Lastly, SE–focused EE exhibited strong reliability (α = 0.907, CR = 0.923, AVE = 0.548). Collectively, the outer loadings of all items exceeded 0.60, further validating item reliability and ensuring that each indicator significantly contributes to its respective construct. These results confirm that the measurement model is statistically sound, with all constructs meeting the standard reliability and validity requirements for further structural modeling analysis.

Table 1: *Construct Reliability and Validity.*

Variables	Items	Outer Loading	Cronbach's Alpha (α)	CR	AVE
Affective Outcomes	AO1	0.785	0.894	0.917	0.614
	AO2	0.763			
	AO3	0.829			
	AO4	0.842			
	AO5	0.838			
	AO6	0.693			
	AO7	0.724			
Cognitive Outcomes	CO1	0.671	0.875	0.903	0.572
	CO2	0.724			
	CO3	0.837			
	CO4	0.712			
	CO5	0.708			
	CO6	0.720			
	CO7	0.810			

Entrepreneurial Self-Efficacy	ESS1	0.747	0.765	0.855	0.577
	ESS2	0.804			
	ESS3	0.838			
	ESS4	0.853			
	ESS5	0.888			
General Knowledge	GK1	0.816	0.893	0.916	0.610
	GK2	0.777			
	GK3	0.830			
	GK4	0.765			
	GK5	0.785			
	GK6	0.752			
	GK7	0.739			
Learning Environment	LE1	0.843	0.914	0.905	0.516
	LE2	0.845			
	LE3	0.816			
	LE4	0.836			
	LE5	0.838			
	LE6	0.837			
	LE7	0.828			
	LE8	0.753			
	LE9	0.770			
	LE10	0.794			
	LE11	0.799			
	LE12	0.785			
	LE13	0.758			
	LE14	0.708			
	LE15	0.708			
Motivational Entrepreneurial Education	MEE1	0.708	0.882	0.915	0.685
	MEE2	0.895			
	MEE3	0.901			
	MEE4	0.864			
	MEE5	0.752			
Skill-Based Outcomes	SBO1	0.782	0.915	0.929	0.547
	SBO2	0.707			
	SBO3	0.746			
	SBO4	0.730			
	SBO5	0.782			
	SBO6	0.778			
	SBO7	0.803			
	SBO8	0.538			
	SBO9	0.791			
	SBO10	0.798			
	SBO11	0.632			
Self-Efficacy–Focused Entrepreneurial Education	SEFEE1	0.652	0.907	0.923	0.548
	SEFEE2	0.621			
	SEFEE3	0.716			
	SEFEE4	0.652			
	SEFEE5	0.790			
	SEFEE6	0.813			
	SEFEE7	0.823			
	SEFEE8	0.820			
	SEFEE9	0.726			
	SEFEE10	0.759			

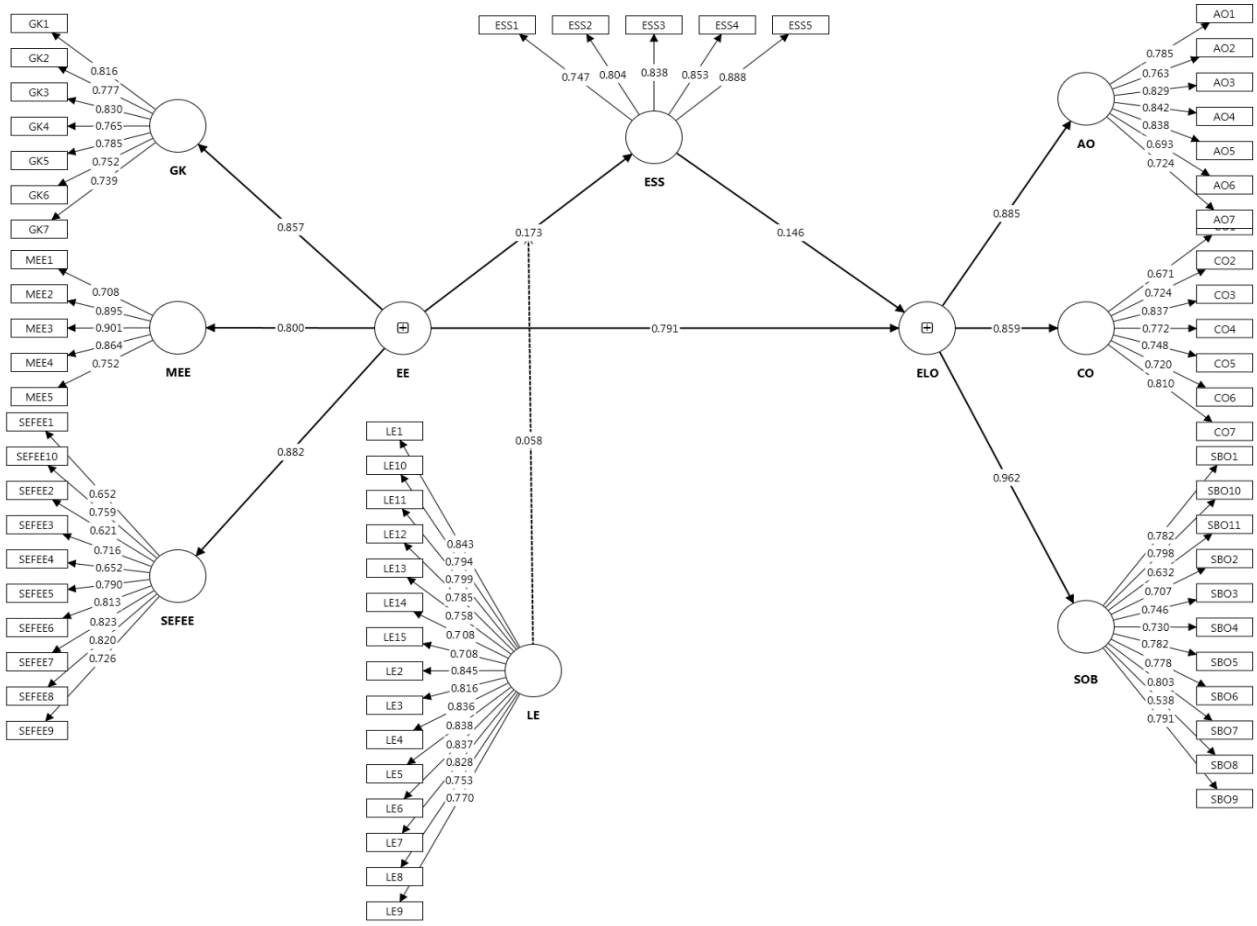

Figure 2: *Measurement Model.*

Table 2 presents the Heterotrait–Monotrait (HTMT) ratio results used to assess discriminant validity among the study constructs. All HTMT values were below the conservative threshold of 0.90, confirming that each construct is empirically distinct and measures a unique aspect of the research model. The results show moderate associations between conceptually related constructs, such as affective outcomes and cognitive outcomes (HTMT = 0.691), and between affective outcomes and skill-based outcomes (HTMT = 0.842), indicating theoretical alignment yet clear differentiation. The LE showed a relatively high but acceptable correlation with ESE (HTMT = 0.814), suggesting that a supportive educational climate is naturally linked with greater self-belief among students. Other relationships, such as those between ESE and general knowledge (HTMT = 0.255) or cognitive outcomes (HTMT = 0.316), were relatively low, further validating discriminant separation. Overall, the HTMT results confirm that all constructs in the study are distinct, reliable, and suitable for further structural equation modeling, thereby establishing strong evidence of discriminant validity within the measurement model.

Table 2: *Discriminant validity (HTMT).*

	AO	CO	ESS	GK	LE	MEE	SEFEE	SOB
Affective Outcomes								
Cognitive Outcomes	0.691							
Entrepreneurial Self-Efficacy	0.309	0.316						
General Knowledge	0.612	0.555	0.255					
Learning Environment	0.566	0.516	0.814	0.573				
Motivational Entrepreneurial Education	0.508	0.482	0.271	0.720	0.556			
Self-Efficacy–Focused	0.793	0.813	0.287	0.642	0.531	0.591		
Skill-Based Outcomes	0.842	0.848	0.294	0.622	0.577	0.567	0.843	

Table 3 gives the findings of the coefficient of determination (R2), predictive relevance (Q2) and model fit (Figure 3) measures of the endogenous constructs. The values of the R2 show that the proposed model explains a significant percentage of the variance in the outcome variables. The R2 value of entrepreneurial learning outcome was 0.626 (adjusted R2 = 0.624) which implies that EE and ESE are able to explain about 62.6 of the variance in entrepreneurial learning outcome. Equally, ESE had a strong explanatory power (R2 = 0.713) meaning that EE and LE combine to explain 71.3 percent of SE variance. Both constructs (0.417 (learning outcomes) and 0.462 (SE)) have a positive q2 value, which shows a good predictive relevance and and it is a confirmation of the strength of the model in making out of sample predictions. The fit indices of the model are also adequate as the standardized root mean square residual (SRMR) of the model stands at 0.067 which is less than the standard of 0.08 indicating a good model fit. Also, root mean square error (RMSE = 0.298) and mean absolute error (MAE = 0.233) values can also be used to prove the accuracy and predictive capability of the model. On the whole, the findings indicate that the model has a good explanatory and predictive strength, which can be taken as evidence of its suitability in testing structural relationships between constructs.

Table 3: *R-Square and Model Goodness-of-Fit Statistics.*

Endogenous Construct	R^2	R^2 Adjusted	Q^2predict	RMSE	MAE	SRMR
Entrepreneurial Learning Outcomes	0.626	0.624	0.417	0.298	0.233	0.067
Entrepreneurial Self-Efficacy	0.713	0.710	0.462	0.274	0.219	

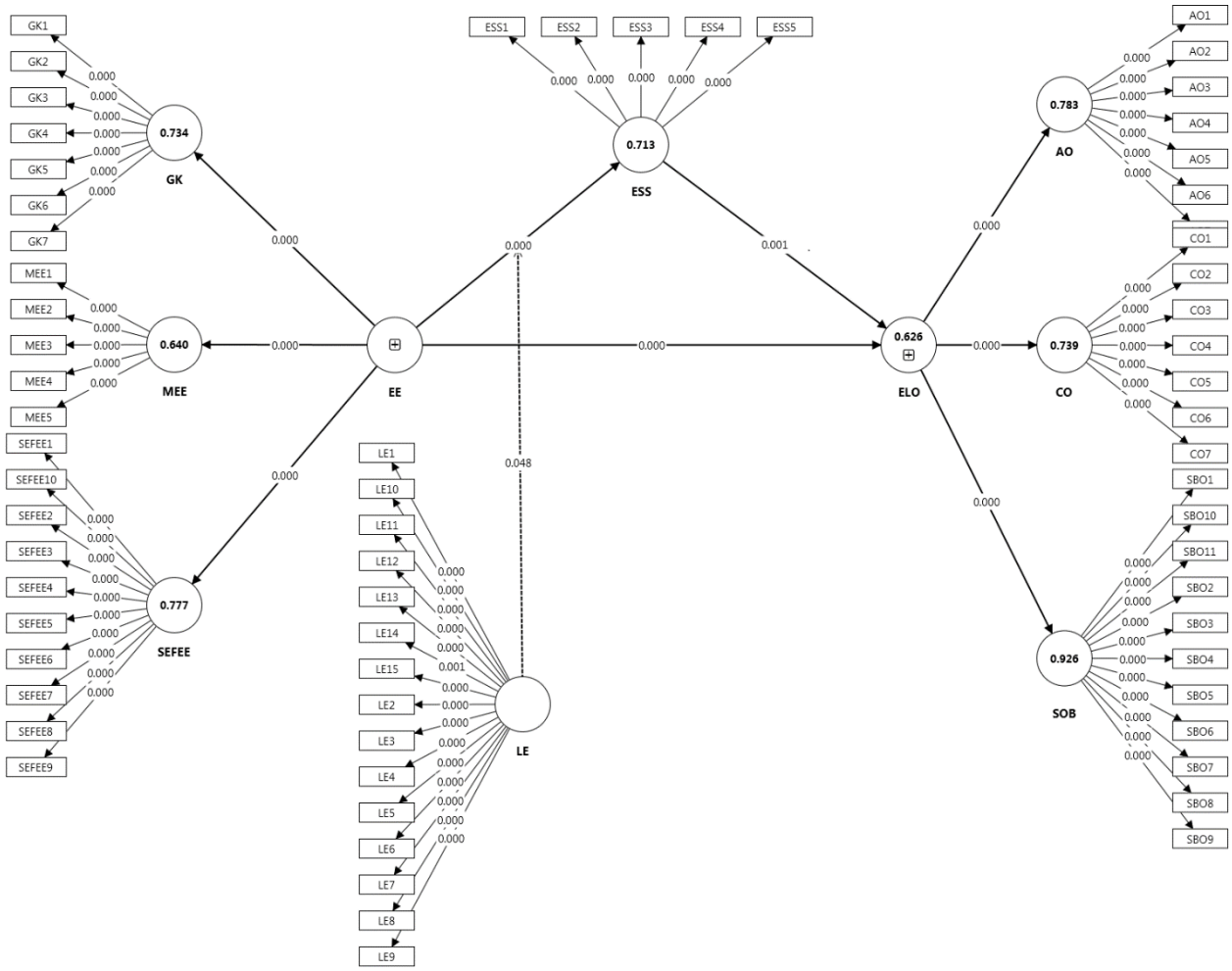

Figure 3: *Structural Model.*

Table 4 and Figure 3 summarize the results of the hypothesis testing through path coefficient analysis. All four hypotheses were statistically supported, confirming the significance of the proposed relationships. The

first hypothesis, stating that EE positively influences ELO, was strongly supported (β = 0.790, t = 24.444, p = 0.000), indicating that higher exposure to EE leads to improved learning outcomes among students. The second hypothesis, proposing that EE positively influences ESE, was also confirmed (β = 0.109, t = 2.148, p = 0.001), validating that EE enhances students' confidence in their entrepreneurial abilities. The third hypothesis, asserting that ESE mediates the relationship between EE and ELO, was supported (β = 0.312, t = 6.274, p = 0.000), demonstrating that SE serves as a critical psychological mechanism linking educational experiences to learning performance. Finally, the fourth hypothesis, which proposed that the LE moderates the relationship between EE and ESE, was also validated (β = 0.058, t = 1.669, p = 0.048). Although the moderating effect is smaller in magnitude, its statistical significance confirms that a supportive LE strengthens the impact of education on SE development. Collectively, these results confirm that EE not only directly enhances learning and SE but also operates through psychological and contextual pathways, reinforcing the theoretical model developed in this study.

Table 4: *Path Analysis.*

Path Relationship	β (Beta)	t-value	p-value	Decision
H1: EE positively influences ELO	0.790	24.444	0.000	Supported
H2: EE positively influences ESE	0.109	2.148	0.001	Supported
H3: ESE mediates the relationship between EE and ELO	0.312	6.274	0.000	Supported
H4: LE moderates the relationship between EE and ESE	0.058	1.669	0.048	Supported

Discussion

EE has emerged in the modern globalized economy as one of the most important elements in higher education curriculum, as it provides students with skills, attitudes, and self-confidence required to face uncertainty and develop new solutions. The results of this research confirm that EE is not merely an academic activity it is rather a transformative learning experience which develops the cognitive capacity of the students, encourages the affective devotion, and provokes behavioral work on the topic of entrepreneurship. EE can facilitate the combination of theory and practice through the introduction of experiential learning, allowing the student to find opportunities, handle difficulties, and effectively innovate by providing them with case-based instruction, startup simulations, and project-based evaluation.

The results of the current study showed that EE has a strong positive impact on the ELO, which can confirm the first hypothesis. This finding complies with a broad range of current literature that indicates that organized entrepreneurship training is indeed helpful in terms of promoting the entrepreneurial skills, cognitive knowledge and behavioral preparedness of students to undertake entrepreneurial endeavors (Miço & Cungu, 2023). The validity of this hypothesis can prove that intervention programs based on the principles of experiential and active learning are instrumental in converting the theoretical knowledge into practical entrepreneurial skills. In line with the research results of Gusma et al. (2025) the outcome indicates that the participants in entrepreneurship courses not only acquire technical knowledge of business, but also better problem solving abilities, creativity and opportunities identification capabilities. This is a good relationship that can be credited to the fact that EE is experiential and thus it introduces the students to real world entrepreneurial issues by exposing them to case studies, project based learning, simulations, and through exposure to entrepreneurs. Through these experiences learners are able to assimilate entrepreneurial thinking and implement conceptual learning in real life situations thereby leading to improved learning outcomes. Besides, this observation confirms the ELT (Kolb, 2014), which assumes that the knowledge is developed when the experience is transformed, which is why it is reasonable to assume that students can learn more efficiently when they become active, reflective, and experimental in the entrepreneurial settings. Therefore, the validation of the first hypothesis will give good empirical support to the fact that EE is a critical pedagogical instrument that can be used to create the knowledge, attitudes, and skills needed to engage in a successful entrepreneurial act.

The second hypothesis that the incidence of EE on ESE is positive was also validated thus giving more evidence to the motivational and psychological influence of EE. This result is in line with the previous empirical studies that show that enrollment in the entrepreneurship course leads to a rise in confidence levels among students regarding their capacity to do the entrepreneurial tasks (Choshi, 2025). The findings suggest that EE

does not only provide knowledge but it also develops a sense of self-belief and agency, which are important psychological facilitators of entrepreneurial behavior. Such relationship could be explained by SCT (Bandura, 2001), according to which mastery experiences, vicarious learning, and social persuasion are influencing the SE and are the major components of the experiential EE. When students can successfully accomplish entrepreneurial projects, introduce business ideas or take part in simulations, they feel mastered, which helps them to believe in themselves. Social reinforcement and role modeling through interaction with peers, instructors and entrepreneurs also boost self efficacy. The result can also be compared to those of Al-Qadasi et al. (2023) who discovered that EE makes students much more likely to perceive their entrepreneurial skills in various situations. Thus, acceptance of this hypothesis supports the fact that EE does not only form cognitive learning outcome; but also reinforces the psychological basis that should be in place in order to make an entrepreneur successful. Together, the results of the first and second hypotheses offer an empirical validation that EE is a two-fold process in terms of acquiring knowledge and developing SE and, thus, its strategic value in developing future entrepreneurs and in building cultures of innovation-oriented learning in higher education institutions.

Findings of the investigation affirmed that the ESE plays a significant role in mediating between the EE and ELO and therefore the third hypothesis was confirmed. This observation provides robust empirical support to the claim that SE is a psychological mediator in terms of which the experiences in education can be converted into improved learning performance. In line with the SCT (Bandura, 2001), the findings suggest that EE does not only affect the outcomes of learning by knowledge transfer but also the ability of the students to believe that they can successfully accomplish entrepreneurial tasks. The experiences gained through active learning undertaken by students when they are exposed to business simulation, startup projects, and real-world problem solving activities enable them to develop mastery experiences that build confidence as well as influence their sense of competence (Saoula et al., 2023). This boosted self-confidence makes them put more cognitive effort into it, not to give up in the face of adversity, and transfer learned concepts into actual practice, which results in higher entrepreneurial learning performance. In addition, the observation is consistent with the results of earlier research that positively relates SE to internalizing entrepreneurial learning, developing innovative thinking, and putting mined skills into practice (Pham & Le, 2023). In this way, the mediating effect in this study brings out the importance of SE as a mediating variable through which educational interventions produce desired learning and behavioral effects. This finding also makes some theoretical contribution, as it empirically supports the intermediary role of the SCT, as well as broadening the concept of cultivating EE in developing both cognitive and affective aspects of learning.

The fourth hypothesis was also proven to be true in the findings, which stated that the relationship between EE and ESE depend on the LE. This finding shows that the LE and its quality and supportiveness largely determine the success of EE in building the SE of students. The effectiveness of educational interventions on self-belief in students is increased by a positive and resourceful learning setting that involves access to mentorship, institutional support, collaborative opportunities, and culture that promotes experimentation (Le et al., 2023). On the other hand, when EE is not supported, exposed to practice, or effective creative environments, the impact of EE on SE is apt to diminish. This observation strengthens the point that learning does not take place in vacuums and exists under contextual and environmental conditions where students interact. It also endorses the hypotheses of ELT (Kolb, 2014) that holds that the real, interactive, and reflective LEs promote the internalization of knowledge and SE. These findings are empirically consistent with the results of the research that revealed that entrepreneurship programs implemented within supportive ecosystems, including the provision of incubators, startup competitions, and networking events, yield increased confidence and entrepreneurial preparedness (Taneja et al., 2023). Thus, the acceptance of this hypothesis expands the existing body of knowledge on the topic of EE with the focus on the moderating role of the environmental factors on the psychological outcomes. The indicators of support on the third and fourth hypotheses taken together indicate that the impact of EE in the form of empowering LE that promotes SE and allows education experiences to be translated into meaningful ELO is the highest.

To summarize, the results of the study all point to the fact that EE is an important factor in making students learn better and to gain psychological empowerment. The fact that all four hypotheses were accepted testifies to the fact that properly designed EE programs do not only contribute to the knowledge and learning achievement of the students but also their SE, and the LE is one of the most important contextual facilitators. The combination of these findings highlights the fact that EE is best implemented in both a very experiential and

conducive to innovation, thought, and practice environment. This study will not only adds to the theoretical understanding of entrepreneurship but also offer practical implications that are significant to educators and policy makers in a endeavor to formulate meaningful entrepreneurship curriculum by showing the mediating influence of ESE instead of moderating LE influence.

Implications

The finding of this research gives a significant contribution to the literature on entrepreneurship learning and education by contributing to the further explanatory powers of the SCT (Bandura, 2001) and the experience learning theory (Kolb, 2014) in elucidating the role of entrepreneurial learning in the psychological and contextual processes of learning outcomes. The study has empirically validated that ESE is a major mediating construct that explains how educational interventions can transform cognitive and affective experience into measurable entrepreneurial learning results. This highlights the role of self-belief as a psychological facilitate that allows the interference between educational exposure and learning performance and thus add depth to the theoretical perspectives of the process of entrepreneurial development. In addition, the study also reveals the moderating role of LE, which introduces a contextual aspect of the traditional models of EE, and demonstrates that the effectiveness of educational courses can be influenced by the presence of a positive institutional and social environment. The outcome of this discovery contributes to the body of theory since the internal (SE) and external (LE) variables are included in one comprehensive framework, which offers a more holistic approach to the entrepreneurial learning processes. Additionally, the results indicate that EE is not linear and the process is dynamic between the pedagogical design and psychological empowerment and environmental support. By doing so, this research paper contributes to the progressive theory of the conceptualization and empirical validation of a multidimensional model through which educational practices would be conducted up to the stage of sustainable entrepreneurial competencies.

The applied implications of the findings of this research are also not in vain to the educators, policymakers and the institutions of higher learning who would like to enhance the quality and effectiveness of EE. The results highlight the need of the curriculum in EE not being based on much theoretical learning but must include some aspects of experiential and participative learning such as simulations, projects, internship and work with entrepreneurs so that the students can gain confidence and competence. The teachers are encouraged to design curriculum that strongly engages the students to tackle real world issues and cogitate on them and consequently contributing to self efficacy and retention of knowledge. Both institutions should also invest in provision of enabling learning systems in terms of incubation centers, mentorship network, innovation labs and funding opportunities where students can apply to practice what they learn in classroom into real life scenarios. The fact that the LE moderates the education and SE association is a pointer that higher institutions of learning should pay attention to an entrepreneurial culture that promotes experimentation, risk-taking, and resilience. The research reveals to the policy makers the importance of developing national education policies that entail the impartation of entrepreneurship in different levels of learning in an effort to inculcate entrepreneurial attitudes in the different course work. Moreover, the study has implications to program evaluators since the study observes that the program success could only be addressed in terms of entrepreneurship intentions but other relevant areas that need to be addressed are learning outcomes and the development of SE as other critical indicators of education success. All these practical implications point to the fact that, in the long term, such training in the EE is psychologically empowering and there is the context that leads to not only the formation of future entrepreneurs but as well innovative, self reliant and adaptive graduates ready to contribute to the economic and social development.

Limitations and Future Research Directions

Although the study contributes to the research on how EE affects learning outcomes and SE significantly, a number of limitations must be noted, which can serve as useful guidance upon the research in the future. To begin with, the research design was a cross-sectional study and this does not give the opportunity of determining any causal relationship between EE, SE, and learning outcomes. The future studies may be conducted either in a longitudinal or an experimental study to be able to evaluate the changes in these relationships with time and to see whether the effects can be maintained in the long-term. Second, the data have been gathered through self-

reported questionnaire which might be subjected to the common method bias and social desirability. Further research may involve a combination of self-reported data and behavioral tests, interviews, or performance based scales to gain a more comprehensive view of entrepreneurial learning. Third, the sample used in the research was restricted to a certain group of students in a certain educational and cultural environment, which can have some effect on the externalization of the study results to other realities. A comparative study made between various countries, fields or types of institution might yield greater details into cultural or contextual differences in the efficiency of EE. Moreover, the analysis of SE and LE as the mediating and moderating variables were the primary factors of the analysis in this study, though in the future, it can be expanded by the use of more psychological or situational variables, namely, entrepreneurial passion, resilience, social capital, or institutional support. Another research area that researchers might consider is the influence of digital learning tools and online entrepreneurship portals on the outcomes of learning, considering the increased significantness of virtual and hybrid instructions. By overcoming these constraints, future research can develop the theoretical knowledge and increase the practical usefulness of EE research in various learning ecologies.

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