

## Articles

# Beyond One-Size-Fits-All: How Academic Discipline Moderates Entrepreneurship Education Effectiveness

Dennis Barber III, PhD<sup>1</sup>, Emily Yeager, PhD<sup>2</sup>, Tristyn Daughtry, MBA<sup>3</sup>, Michael L. Harris, EdD<sup>1</sup>, Sharon Paynter, PhD<sup>4</sup>

<sup>1</sup> Entrepreneurship, East Carolina University, <sup>2</sup> Recreation Sciences & Sport Management, East Carolina University, <sup>3</sup> Town of Winterville, <sup>4</sup> Political Science, East Carolina University

Keywords: entrepreneurship education, academic discipline, entrepreneurial attitude, entrepreneurial intention, program evaluation, MANOVA

<https://doi.org/10.53703/001c.161336>

---

## Small Business Institute Journal

Vol. 22, Issue 2, 2026

---

Entrepreneurship education has expanded beyond business schools, yet programs do not operate uniformly across disciplines. Grounded in Shapero and Sokol's (1982) Entrepreneurial Event Model, this study examined whether an interdisciplinary program produced differential effects on entrepreneurial attitudes, intentions, and reflection based on students' college affiliation. Using a quasi-experimental, repeated-measures design, 104 participants (post-survey  $N = 92$ ) across seven colleges completed a consulting-based entrepreneurship program over the course of 8 semesters. Pre- and post-surveys measured Entrepreneurial Attitudinal Orientation (Achievement, Self-Esteem, Personal Control, Innovation), Entrepreneurial Intention, and Reflection. Multivariate analysis of variance (MANOVA) and multivariate regression provided complementary analyses. Results revealed no overall program effect (Wilks'  $\Lambda = .064$ ,  $p = .116$ ), but a significant interaction between participation and college affiliation (Wilks'  $\Lambda = .047$ ,  $p = .014$ , partial  $\eta^2 = .399$ ). Business and Engineering students showed significantly higher gains in Achievement ( $p = .002$ ), Personal Control ( $p < .001$ ), and Reflection ( $p = .004$ ) compared to Education, Arts & Sciences, and Fine Arts students. The presence of a program manager showed no effect ( $p = .974$ ). The divergence between MANOVA detecting subscale-level effects and regression showing no composite-level effects suggests college affiliation influences specific entrepreneurial attitude dimensions differently. Findings demonstrate that students with training emphasizing problem-solving, innovation, and applied business concepts benefit most. Entrepreneurship programs should incorporate discipline-specific scaffolding that leverages existing knowledge while addressing field-specific barriers to entrepreneurial self-efficacy.

## Introduction

Entrepreneurship education has proliferated across university campuses worldwide, yet programs designed to reach all students may not serve all students equally well (Bae et al., 2014; Fayolle & Gailly, 2008; Liñán & Fayolle, 2015). These cross-disciplinary programs rest on the premise that entrepreneurial capabilities can develop systematically through structured learning experiences rather than representing innate traits (Fayolle et al., 2015). Meta-analytic evidence demonstrates that entrepreneurship education can enhance students' entrepreneurial intentions through changes in attitudes, self-efficacy, and perceived behavioral control (Bae et al., 2014; Schlaegel & Koenig, 2014). However, substantial heterogeneity exists in program effectiveness across contexts and populations, suggesting that entrepreneurship education does not operate uniformly (Cumberland et al., 2024; Zhang et al., 2014).

Shapero and Sokol's (1982) Entrepreneurial Event Model provides the theoretical foundation for understanding how educational interventions influence entrepreneurial devel-

opment. The model identifies perceived desirability (the attractiveness of entrepreneurship) and perceived feasibility (confidence in one's entrepreneurial capabilities) as critical psychological antecedents to entrepreneurial intention and action (Duong & Le, 2021; Schlaegel & Koenig, 2014). Entrepreneurship education programs aim to systematically enhance both dimensions through exposure to entrepreneurial concepts, skill development, and authentic learning experiences.

Despite progress in entrepreneurship education research, critical gaps limit theoretical understanding and practical application. First, few investigations have systematically examined differential effects across academic disciplines using rigorous quasi-experimental designs (Barba-Sánchez & Atienza-Sahuquillo, 2018; Zhang et al., 2014). Emerging evidence suggests students from technical fields such as engineering and business may benefit differently than peers in humanities, education, or fine arts, potentially due to differences in baseline self-efficacy or alignment between disciplinary training and entrepreneurial

competencies (Liñán, 2004; Zhang et al., 2014). However, the mechanisms underlying these differences remain incompletely understood. Second, most research examines either attitudes or intentions in isolation, with fewer studies investigating both alongside metacognitive outcomes such as reflective capacity (Kember et al., 2000). Finally, methodological limitations characterize existing literature: many studies lack baseline comparisons or employ only global outcome measures without examining specific dimensions of complex constructs like entrepreneurial attitude (Fayolle et al., 2015; Robinson et al., 1991).

The present study addresses these gaps through a quasi-experimental evaluation of a student consulting internship program at a southeastern US university, an interdisciplinary initiative engaging students from seven distinct academic colleges. Using a repeated-measures design with pre-test and post-test assessments, we examined program effects on four dimensions of Entrepreneurial Attitudinal Orientation (Achievement, Self-Esteem, Personal Control, Innovation), Entrepreneurial Intention, and Reflection. Employing complementary analytical strategies — multivariate analysis of variance (MANOVA) to examine subscales separately and multivariate regression to examine composite scores — the study provides both fine-grained and global assessments of program impact.

This research makes several important contributions. Theoretically, it extends the Entrepreneurial Event Model by examining how educational interventions differentially influence entrepreneurial intention's antecedents across academic disciplines. Methodologically, it demonstrates the value of multiple analytical approaches for capturing both specific and global program effects. Practically, findings regarding disciplinary variation can inform differentiated interventions that leverage students' existing domain knowledge while addressing discipline-specific needs (Barber et al., 2021; do Paço & Alves, 2024; Zollet et al., 2024).

The paper proceeds as follows. The literature review synthesizes theory and prior evidence on entrepreneurship education outcomes, disciplinary variation in entrepreneurial attitudes and intentions, and metacognitive dimensions including reflective capacity. The program section describes the interdisciplinary student consulting initiative and its implementation across eight semesters. The method section details the quasi-experimental, repeated-measures design and analytical strategy. Results present findings from complementary MANOVA and multivariate regression analyses examining both subscale and composite outcomes. The paper concludes with a discussion of theoretical and practical implications, acknowledgment of limitations, and directions for future research.

## Literature Review

### Entrepreneurship Education and Student Outcomes

Meta-analytic evidence demonstrates that entrepreneurship education significantly enhances students' entrepreneurial intentions, with effects mediated through changes in entrepreneurial attitudes, self-efficacy, and per-

ceived behavioral control (Bae et al., 2014; Martin et al., 2013). Fayolle et al. (2015) identified considerable heterogeneity in program effectiveness, with passive, lecture-based approaches producing smaller effects than active, experiential learning models that engage students in real-world problem-solving. Empirical research consistently demonstrates positive associations between entrepreneurship education participation and entrepreneurial intention, with education operating through multiple psychological pathways including attitude formation and feasibility enhancement (Wang et al., 2011).

### The Role of Academic Discipline

While aggregate evidence supports entrepreneurship education effectiveness, emerging research reveals substantial heterogeneity in program impact across student populations differentiated by academic discipline. Zhang et al. (2014) found that students with technical backgrounds exhibited significantly higher entrepreneurial intentions than peers in humanities and social sciences, attributing this difference to technical students' stronger problem-solving orientation, greater exposure to innovation processes, and enhanced confidence in developing novel products or services.

This disciplinary variation extends beyond intention to encompass entrepreneurial self-efficacy and attitude formation. Engineering and business students often enter entrepreneurship programs with higher baseline levels of perceived feasibility due to their prior training in analytical thinking, project management, and market analysis (Barba-Sánchez & Atienza-Sahuquillo, 2018). Consequently, entrepreneurship education may operate differently across disciplines—either amplifying existing advantages among business and engineering students or working to reduce initial gaps among students from other fields.

The mechanisms underlying disciplinary differences likely involve both selection effects (students with entrepreneurial propensities gravitating toward certain majors) and socialization effects (disciplinary training cultivating specific cognitive frameworks and skill sets). Liñán (2004) proposed that academic disciplines vary in their emphasis on autonomy, innovation, and risk-taking—values that align closely with entrepreneurial orientations. These disciplinary differences may also extend to risk tolerance and entrepreneurial attitudes, with prior research demonstrating cross-cultural variation in such orientations (Barber, 2015; Barber et al., 2016). Understanding how disciplinary context shapes entrepreneurship education outcomes remains a critical research priority.

### Entrepreneurial Attitudes and Intentions

Robinson et al. (1991) developed the Entrepreneurial Attitude Orientation (EAO) scale as a multidimensional measure assessing four dimensions: Achievement (drive for accomplishment), Self-Esteem (confidence in one's abilities), Personal Control (internal locus of control), and Innovation (preference for creativity). This framework conceptualizes entrepreneurial attitude as a constellation of interrelated

orientations that collectively predispose individuals toward entrepreneurial behavior. Schlaegel and Koenig (2014) found that attitude toward entrepreneurship ranks among the strongest predictors of entrepreneurial intention ( $p = .48$ ), though the relationship appears moderated by cultural context and educational background.

Entrepreneurial intention, defined as a conscious state of mind directing attention toward starting a new business, serves as the most proximal predictor of actual entrepreneurial behavior (Liñán & Chen, 2009). The formation of entrepreneurial intention follows a developmental process influenced by attitudes, subjective norms, and perceived behavioral control. Short-term educational interventions may produce immediate changes in knowledge and attitudes without corresponding shifts in intention, particularly among students committed to traditional employment paths (Liñán & Fayolle, 2015).

Perceived desirability, defined as the degree to which an individual finds entrepreneurship personally attractive, functions as a foundational antecedent to entrepreneurial intention within Shapero and Sokol's (1982) framework. Prior entrepreneurship education research has conceptualized desirability as a malleable attitudinal orientation shaped by exposure to entrepreneurial concepts, experiential activities, and structured reflection (Fayolle & Gailly, 2008; Liñán & Fayolle, 2015). Programs targeting desirability aim to shift students' perceptions of entrepreneurship from an abstract or inaccessible pursuit toward a personally viable and attractive career path. Empirical evidence on desirability change through educational interventions has proven mixed. Bae et al. (2014) found that entrepreneurship education produced modest and inconsistent effects on attitudinal components of intention, with desirability-related attitudes proving more resistant to short-term change than feasibility perceptions. Schlaegel and Koenig (2014) similarly found that attitudinal evaluations closely aligned with desirability varied substantially in their relationship to intention across educational and cultural contexts. Fayolle et al. (2015) attributed much of this variability to program design, noting that experiential and consulting-based approaches generated stronger desirability shifts than lecture-based curricula. Within the present study, desirability-relevant outcomes surface across multiple EAO dimensions, particularly Achievement and Innovation, as well as through the Entrepreneurial Intention measure, which captures the attractiveness of new venture creation as a career path (Duong & Le, 2021; Robinson et al., 1991).

## Reflection and Metacognitive Development

The capacity for reflection—critical examination of one's learning processes and outcomes—represents an important but underexamined dimension of entrepreneurship education effectiveness (Kember et al., 2000). Reflection enables students to extract transferable principles from learning experiences, recognize knowledge gaps, and develop strategies for continued learning. In entrepreneurship contexts, reflective capacity may prove particularly valuable given the inherently uncertain nature of new venture creation,

which requires continuous adaptation and learning from both successes and failures.

## The Role of Program Supervision and Mentorship in Experiential Learning

Structured supervision and mentorship represent important but underexamined design features of entrepreneurship education programs, particularly those employing work-integrated or consulting-based models (Fayolle et al., 2015). Within experiential learning frameworks, a dedicated program supervisor serves functions beyond administrative coordination, providing ongoing guidance, performance feedback, and professional socialization that shape students' perceived feasibility and desirability of entrepreneurial activity (Fayolle & Gailly, 2008). Regular contact between students and a program manager, including onboarding, scope-of-work development, weekly check-ins, and preparation for client-facing deliverables, mirrors the relational structure identified in mentorship literature as conducive to self-efficacy development and professional identity formation. Cumberland et al. (2024) noted that program design features mediating student-to-practitioner contact consistently strengthened entrepreneurial attitude outcomes relative to programs lacking such structural supports. The present study examines whether the presence of a dedicated Program Manager, who supervised student consultants, coordinated client relationships, and facilitated final presentations, produced measurable differences in entrepreneurial attitudes and intentions, extending prior work on how mentorship-adjacent roles shape the entrepreneurship education experience.

## Theoretical Framework

The theoretical foundation for understanding entrepreneurial intention formation rests primarily on Shapero and Sokol's (1982) Theory of Entrepreneurial Event, which posits that entrepreneurial opportunities can either emerge through discovery or creation via systematic process. The Entrepreneurial Event Model emphasizes two key determinants of entrepreneurial intention: perceived desirability (PD) and perceived feasibility (PF) (Duong & Le, 2021; Schlaegel & Koenig, 2014).

Perceived desirability refers to the degree to which an individual finds the prospect of starting a business attractive and personally appealing, encompassing both affective evaluations and anticipated social approval of entrepreneurship as a career path (Shapero & Sokol, 1982). Perceived feasibility reflects an individual's self-assessment of their capability to successfully execute entrepreneurial activities, encompassing confidence in one's skills, knowledge, and access to necessary resources (Duong & Le, 2021; Wang et al., 2011). These constructs operate synergistically: even when individuals find entrepreneurship highly desirable, low perceived feasibility can inhibit intention formation, and vice versa.

Recent applications of the Entrepreneurial Event Model have demonstrated its relevance across diverse cultural and educational contexts, showing how entrepreneurship edu-

cation interventions can systematically enhance both dimensions. This theoretical framework provides the conceptual scaffolding for understanding how structured educational programs might influence students' entrepreneurial trajectories by targeting these critical psychological mechanisms.

Informed by the theory and literature review, this study tests three hypotheses:

**H1:** Participation in the RISE29 program will significantly improve students' entrepreneurial attitudinal orientation (Achievement, Self-Esteem, Personal Control, Innovation), Entrepreneurial Intention, and Reflection from pre-test to post-test.

**H2:** The effect of RISE29 program participation on entrepreneurial outcomes will vary significantly by students' college affiliation.

**H3:** The presence of a dedicated program manager will moderate the effect of program participation on entrepreneurial outcomes, such that students who participated during the program manager's tenure will show greater improvements than those who participated before the program manager's tenure.

### About the Program

The program represents an interdisciplinary entrepreneurship education initiative at a southeastern US university designed to cultivate entrepreneurial mindsets, skills, and intentions among students from diverse academic backgrounds. The program engages students from seven distinct colleges including Allied Health Sciences, Arts and Sciences, Business, Education, Engineering and Technology, Fine Arts and Communication, and Health and Human Performance. This cross-disciplinary approach reflects the growing recognition that entrepreneurial competencies hold value across all fields and that innovation often emerges at the intersection of diverse knowledge domains.

The program operated in-person over eight consecutive semesters, with each semester constituting an independent cohort of eight to twelve students. Cohorts did not carry over between semesters; each group completed the full program within a single term, with students from different cohorts occasionally collaborating or supporting one another on shared project elements. Students participated as paid interns and external consultants, working approximately 20 hours per week throughout the semester in service of live client engagements with local businesses and organizations.

The curriculum emphasized experiential learning through direct client work rather than traditional coursework. Guest lecturers drawn from professional practice and academia delivered structured training sessions on industry analysis, internal organizational analysis, public speaking and presentation skills, the consulting process, and special topics selected based on the client portfolio of each cohort. This approach ensured that instructional content remained directly applicable to the consulting projects students were actively managing, reinforcing the integration of conceptual knowledge and applied practice.

During the study period, a significant programmatic change occurred with the introduction of a dedicated Program Manager. This role extended well beyond administrative coordination. The Program Manager sourced and secured client engagements, developed scopes of work, onboarded students as paid employees, conducted weekly check-ins and timecard reviews, and organized the final client presentation events that concluded each semester. This sustained, structured supervisory relationship positioned the Program Manager as a functional mentor within the experiential learning environment, providing the ongoing professional guidance and accountability that prior research associates with self-efficacy development and entrepreneurial attitude formation (Cumberland et al., 2024; Fayolle et al., 2015). [Table 1](#) summarizes the key programmatic elements across both phases of program implementation.

## Methods

### Research Design

This study employed a quasi-experimental, repeated-measures design to evaluate the effectiveness of the entrepreneurship program. Participants completed identical survey instruments at program entry (pre-survey) and program completion (post-survey). This within-subjects design allowed for examination of individual change trajectories while controlling for individual differences in baseline characteristics.

The study incorporated two complementary analytical strategies. First, multivariate analysis of variance (MANOVA) examined effects on five dependent variables separately: the four Entrepreneurial Attitudinal Orientation (EAO) subscales (Achievement, Self-Esteem, Personal Control, and Innovation) and Reflection. Second, multivariate multiple regression examined effects on three composite-level variables: overall EAO (mean of the four subscales), Entrepreneurial Intention (EI), and Reflection. This dual-method approach enabled detection of effects that might become obscured when examining only aggregate measures.

Three MANOVA models received testing: (1) overall pre/post participation effects; (2) the interaction between program participation and college affiliation; and (3) a three-way interaction incorporating program manager presence. For regression analyses, separate models underwent testing at each timepoint, comparing a model including program manager presence as a predictor against an intercept-only baseline model.

### Participants

The study sample consisted of undergraduate students enrolled in the program over eight semesters. The pre-survey sample included 104 participants representing seven colleges: Allied Health Sciences ( $n = 18$ , 17.3%), Arts and Sciences ( $n = 15$ , 14.4%), Business ( $n = 31$ , 29.8%), Education ( $n = 8$ , 7.7%), Engineering and Technology ( $n = 12$ , 11.5%), Fine Arts and Communication ( $n = 10$ , 9.6%), and

**Table 1. Program Overview and Structural Elements**

| Feature                 | Description                                                                                                      |
|-------------------------|------------------------------------------------------------------------------------------------------------------|
| Format                  | In-person                                                                                                        |
| Duration                | One semester (per cohort)                                                                                        |
| Cohort Size             | 8–12 students per semester                                                                                       |
| Total Semesters         | 8                                                                                                                |
| Student Time Commitment | 20 hours per week                                                                                                |
| Colleges Represented    | 7                                                                                                                |
| Compensation            | Paid internship / consulting                                                                                     |
| Instructional Content   | Guest lectures: industry analysis, internal analysis, consulting process, public speaking, special topics        |
| Client Work             | Live engagements with local businesses; scopes of work developed with Program Manager                            |
| Program Manager Role    | Client acquisition, student onboarding, weekly supervision, timecard management, final presentation facilitation |
| Program Manager Phase   | Semesters 1–3: no Program Manager; Semesters 4–8: Program Manager present                                        |

Health & Human Performance ( $n = 10$ , 9.6%). The post-survey sample consisted of 92 participants, representing an 88.5% retention rate.

Regarding program manager presence, 35 participants (33.7%) participated before a dedicated program manager received hire, while 69 participants (66.3%) participated during the manager's tenure. All participants provided informed consent, and the study received IRB approval.

### Measures and Instrumentation

All measures employed validated instruments using Likert-type response formats, selected for established psychometric properties and theoretical alignment with the Entrepreneurial Event Model.

**Entrepreneurial Attitudinal Orientation (EAO).** Entrepreneurial attitudes received assessment using four subscales from Robinson et al. (1991). **Achievement** underwent measurement using four items on a 9-point Likert scale ( $\alpha = .671$  pre-survey,  $\alpha = .632$  post-survey). Sample item: "I always try to do better than expected of me." **Self-Esteem** used three items ( $\alpha = .704$  pre-survey,  $\alpha = .709$  post-survey). Sample item: "I am confident in my ability to succeed." **Personal Control** employed four items ( $\alpha = .744$  pre-survey,  $\alpha = .766$  post-survey). Sample item: "I control my own destiny." **Innovation** assessed six items ( $\alpha = .691$  pre-survey,  $\alpha = .735$  post-survey). Sample item: "I enjoy finding new ways to accomplish things." For regression analyses, an overall EAO score emerged through averaging the four subscale scores.

**Entrepreneurial Intention (EI).** Entrepreneurial intention underwent measurement using the 6-item scale by Liñán and Chen (2009) on a 7-point Likert scale. Sample item: "I stand ready to do anything required to become an entrepreneur." The scale demonstrated excellent reliability ( $\alpha = .966$  pre-survey,  $\alpha = .976$  post-survey).

**Reflection.** Reflective capacity received assessment using an adapted 3-item scale based on Kember et al. (2000) on a 7-point Likert scale. Sample item: "I think about how I

learn and whether I could improve it" ( $\alpha = .684$  pre-survey,  $\alpha = .801$  post-survey).

**Program Manager Presence.** The presence of a dedicated program manager received operationalization as a binary variable: 1 = Pre-Program Manager and 2 = Post-Program Manager.

### Procedure

Participants completed the pre-survey electronically at program entry, requiring approximately 15–20 minutes. Following survey completion, students participated in the curriculum, which remained consistent across cohorts. Upon program completion, participants completed the post-survey containing identical measures. All data collection and storage complied with university data protection policies and IRB requirements.

### Data Analysis

Data screening procedures occurred prior to analysis. Cases with substantial missing data (>20% of items) received exclusion. For remaining cases with sporadic missing data, expectation-maximization (EM) algorithm provided imputation. Descriptive statistics were calculated for all variables. Normality assumptions were evaluated using criteria that skewness values between -1 and +1 and kurtosis values between -2 and +2 indicate acceptable normality (George & Mallery, 2010). Following standard psychometric procedures, items demonstrating poor item-total correlations were systematically removed to optimize internal consistency while maintaining content validity.

MANOVA served as the primary analytical approach due to its ability to simultaneously examine multiple dependent variables while controlling familywise error rate. Wilks' Lambda served as the multivariate test statistic, with statistical significance set at  $\alpha = .05$ . Effect sizes received reporting using partial  $\eta^2$ , interpreted using Cohen's (1988) guidelines: .01 = small, .06 = medium, .14 = large. For significant college differences, Tukey's HSD post hoc tests received employment.

**Table 2. Participant Demographics and Sample Characteristics**

| College                     | Pre-Survey (N=104) |       | Post-Survey (N=92) |       |
|-----------------------------|--------------------|-------|--------------------|-------|
|                             | n                  | %     | n                  | %     |
| Allied Health Sciences      | 18                 | 17.3% | 16                 | 17.4% |
| Arts and Sciences           | 15                 | 14.4% | 13                 | 14.1% |
| Business                    | 31                 | 29.8% | 28                 | 30.4% |
| Education                   | 8                  | 7.7%  | 7                  | 7.6%  |
| Engineering and Technology  | 12                 | 11.5% | 11                 | 12.0% |
| Fine Arts and Communication | 10                 | 9.6%  | 9                  | 9.8%  |
| Health & Human Performance  | 10                 | 9.6%  | 8                  | 8.7%  |

Note. Program Manager Presence: Pre-survey: Pre-Program Manager n = 35 (33.7%), Post-Program Manager n = 69 (66.3%); Post-survey: Pre-Program Manager n = 35 (38.0%), Post-Program Manager n = 57 (62.0%).

Complementary regression analyses examined program effects on three composite-level outcomes. Standardized regression coefficients ( $\beta$ ),  $R^2$ , adjusted  $R^2$ , F-statistics, and associated p-values received reporting. All analyses occurred using IBM SPSS Statistics Version 27.0. Prior to conducting MANOVA, assumptions of multivariate normality, homogeneity of variance-covariance matrices, and absence of multicollinearity underwent evaluation.

## Results

### Data Screening and Preliminary Analyses

Data screening revealed that 12 participants (11.5%) did not complete post-surveys, resulting in a matched sample of 92 participants. Little's MCAR test confirmed that data disappeared completely at random ( $\chi^2 = 47.32$ ,  $p = .184$ ). Sporadic item-level missing data (<3%) received handling using EM imputation. Three outliers on Self-Esteem remained in analysis as legitimate responses. All variables met criteria for univariate normality (skewness: -1.15 to 0.88; kurtosis: -0.42 to 1.42). Multivariate normality assessment suggested minor deviations (Mardia's skewness = 8.47,  $p = .032$ ), though MANOVA generally demonstrates robustness to such deviations with moderate sample sizes (Tabachnick & Fidell, 2013).

### Descriptive Statistics and Sample Characteristics

Table 2 presents participant distribution across colleges. The Business college represented the largest proportion (29.8% pre-survey, 30.4% post-survey), while Education had the smallest representation (7.7% pre-survey, 7.6% post-survey). Distribution remained stable from pre- to post-survey, suggesting attrition lacked systematic relation to college affiliation.

Scale reliability coefficients after item deletion appear in Table 3. Cronbach's alpha values ranged from .632 to .801 across subscales and timepoints. The Entrepreneurial Intention scale demonstrated excellent reliability ( $\alpha = .966$  pre-survey,  $\alpha = .976$  post-survey). All values meet acceptability for exploratory research (Hair et al., 2010).

Descriptive statistics indicated generally high levels of entrepreneurial attitudes and reflection, with Self-Esteem

showing the lowest mean and greatest variability at both timepoints. For composite variables, the overall EAO score measured 7.22 (SD = 0.80) at pre-survey and 7.16 (SD = 0.85) at post-survey. Entrepreneurial Intention showed a mean of 5.40 (SD = 1.51) at pre-survey and 5.29 (SD = 1.67) at post-survey. The relative stability of means from pre- to post-survey foreshadowed the finding of no overall program effects.

### Construct Validity

Achievement, Personal Control, and Innovation demonstrated moderate to strong intercorrelations ( $r = .59-.67$ ,  $p < .001$ ), supporting their conceptualization as related facets. However, Self-Esteem showed near-zero correlations with other EAO subscales ( $r = -.22$  to  $.06$ ), suggesting independent functioning. Overall EAO correlated positively with Entrepreneurial Intention at both timepoints ( $r = .41-.44$ ,  $p < .001$ ), providing support for theoretical models linking attitudes to intentions.

### Assumption Testing for MANOVA

Levene's tests indicated homogeneity of variance for most variables except Self-Esteem ( $F = 2.35$ ,  $p = .036$ ). Box's M test reached significance ( $p = .002$ ) but demonstrates known oversensitivity in moderate samples. Tolerance values (.48-.87) and VIF values (1.15-2.08) indicated no multicollinearity concerns.

### Primary Analyses: Multivariate Analysis of Variance

Three hierarchical MANOVA models underwent testing. Model 1 examined the overall effect of program participation (pre/post) across all students. The multivariate test revealed no significant effect, Wilks'  $\Lambda = .064$ ,  $F(5, 156) = 1.177$ ,  $p = .116$ , partial  $\eta^2 = .372$ . Thus, Hypothesis 1 lacked support.

Model 2 added college affiliation to test whether program effects varied by students' academic discipline. This model revealed a statistically significant interaction between program participation and college affiliation, Wilks'  $\Lambda = .047$ ,  $F(30, 468) = 1.346$ ,  $p = .014$ , partial  $\eta^2 = .399$ . This

**Table 3. Scale Reliability Coefficients (Cronbach's Alpha) After Item Deletion**

| Scale                     | Pre-Survey | Post-Survey | Items Retained | Original Items |
|---------------------------|------------|-------------|----------------|----------------|
| EAO - Achievement         | .671       | .632        | 4              | 5              |
| EAO - Self-Esteem         | .704       | .709        | 3              | 4              |
| EAO - Personal Control    | .744       | .766        | 4              | 5              |
| EAO - Innovation          | .691       | .735        | 6              | 7              |
| Entrepreneurial Intention | .966       | .976        | 6              | 6              |
| Reflection                | .684       | .801        | 3              | 4              |

Note. All reliability coefficients meet or approach the acceptable threshold of .70 for exploratory research (Hair et al., 2010).

**Table 4. Multivariate Tests of Program Effects (MANOVA)**

| Model | Effect                                     | Wilks' $\Lambda$ | F     | df      | p           | Partial $\eta^2$ |
|-------|--------------------------------------------|------------------|-------|---------|-------------|------------------|
| 1     | Pre/Post                                   | .064             | 1.177 | 5, 156  | .116        | .372             |
| 2     | Pre/Post $\times$ College                  | .047             | 1.346 | 30, 468 | <b>.014</b> | .399             |
| 3     | Pre/Post $\times$ College $\times$ Manager | .800             | .490  | 26, 51  | .974        | .200             |

Note. Model 1 examines overall program effect; Model 2 adds college affiliation; Model 3 adds program manager presence as a moderator. Significant effects ( $p < .05$ ) appear in bold. Partial  $\eta^2$  values of .01 = small, .06 = medium, .14 = large effect (Cohen, 1988).

**Table 5. Univariate Tests of Between-Subjects Effects by College (MANOVA Follow-up)**

| Dependent Variable     | F    | df    | p                | Partial $\eta^2$ | Observed Power |
|------------------------|------|-------|------------------|------------------|----------------|
| EAO - Achievement      | 4.12 | 6, 97 | <b>.002</b>      | .203             | .971           |
| EAO - Self-Esteem      | 2.85 | 6, 97 | <b>.013</b>      | .150             | .857           |
| EAO - Personal Control | 5.63 | 6, 97 | <b>&lt; .001</b> | .258             | .992           |
| EAO - Innovation       | 3.45 | 6, 97 | <b>.004</b>      | .176             | .922           |
| Reflection             | 3.78 | 6, 97 | <b>.004</b>      | .189             | .941           |

Note. All tests significant at  $p < .05$  (bolded). Partial  $\eta^2$  interpretation: .01 = small, .06 = medium, .14 = large (Cohen, 1988). Power values  $> .80$  indicate adequate sensitivity.

large effect size demonstrates that the impact of the program varied substantially across colleges, providing strong support for **Hypothesis 2**.

Model 3 tested whether program manager presence moderated the relationship by examining the three-way interaction. Results showed no significant three-way interaction, Wilks'  $\Lambda = .800$ ,  $F(26, 51) = .490$ ,  $p = .974$ , partial  $\eta^2 = .200$ . **Hypothesis 3** lacked support.

### Univariate Follow-up Tests

Given the significant multivariate interaction in Model 2, univariate tests identified which specific dependent variables contributed to the overall effect. Results revealed significant college differences for all five dependent variables: Achievement,  $F(6, 97) = 4.12$ ,  $p = .002$ , partial  $\eta^2 = .203$ ; Self-Esteem,  $F(6, 97) = 2.85$ ,  $p = .013$ , partial  $\eta^2 = .150$ ; Personal Control,  $F(6, 97) = 5.63$ ,  $p < .001$ , partial  $\eta^2 = .258$ ; Innovation,  $F(6, 97) = 3.45$ ,  $p = .004$ , partial  $\eta^2 = .176$ ; and Reflection,  $F(6, 97) = 3.78$ ,  $p = .004$ , partial  $\eta^2 = .189$ . Effect sizes ranged from medium to large, with observed statistical power exceeding .80 for all significant effects.

Post hoc pairwise comparisons using Tukey's HSD test revealed a consistent pattern. Business students ( $M = 8.45$ ,  $SD = 0.89$ ) and Engineering students ( $M = 8.38$ ,  $SD = 0.94$ )

demonstrated significantly higher post-program Achievement scores compared to students from Education ( $p = .006$  and  $p = .011$ ), Arts & Sciences ( $p = .019$  and  $p = .028$ ), and Fine Arts ( $p = .015$  and  $p = .023$ ). For Personal Control, Business students ( $M = 7.89$ ,  $SD = 0.98$ ) and Engineering students ( $M = 7.76$ ,  $SD = 1.05$ ) showed significantly higher scores than Education ( $p < .001$  and  $p = .002$ ), Arts & Sciences ( $p = .002$  and  $p = .008$ ), and Fine Arts students ( $p = .001$  and  $p = .006$ ). For Reflection, Business ( $M = 6.45$ ,  $SD = 0.52$ ) and Engineering ( $M = 6.38$ ,  $SD = 0.58$ ) students again scored significantly higher than Education, Arts & Sciences, and Fine Arts students (all  $p < .05$ ).

### Multivariate Multiple Regression Results

Regression analyses examined whether program manager presence predicted variance in the three composite outcomes. For both pre-survey and post-survey data, program manager presence did not significantly predict overall EAO, Entrepreneurial Intention, or Reflection (all  $p > .10$ ). Effect sizes remained minimal ( $R^2 < .012$ ), and no models reached statistical significance. The adjusted  $R^2$  values became negative for most models ( $-.011$  to  $.003$ ), indicating that the model with program manager presence performed worse than a simple intercept-only model.

## Summary of Hypothesis Testing

**H1** (overall program effects) lacked support. Neither MANOVA nor regression analyses revealed significant improvements in entrepreneurial attitudes, intentions, or reflection from pre- to post-test when examining all students together.

**H2** (college affiliation effects) received strong support. A significant multivariate interaction between program participation and college affiliation emerged ( $p = .014$ , partial  $\eta^2 = .399$ ), with Business and Engineering students demonstrating significantly higher gains than students from Education, Arts & Sciences, and Fine Arts.

**H3** (program manager moderation) lacked support. Neither the three-way MANOVA interaction nor any regression models showed significant effects of program manager presence (all  $p > .10$ ).

The divergence between MANOVA results (detecting significant disciplinary effects at the subscale level) and regression results (showing no effects at the composite level) highlights the importance of examining both fine-grained and global outcome measures in program evaluation research.

## Discussion & Implications

The present study contributes to the growing body of literature demonstrating that entrepreneurship education programs do not operate uniformly across student populations (Cumberland et al., 2024; Zhang et al., 2014). The findings reveal significant variation in how students from different academic disciplines respond to entrepreneurship curriculum, with Business and Engineering students demonstrating substantially greater gains in Achievement, Personal Control, and Reflection compared to peers from Education, Arts & Sciences, and Fine Arts. This pattern aligns with prior research suggesting that students whose academic training emphasizes problem-solving, analytical thinking, and innovation may enter entrepreneurship programs with cognitive frameworks and skill sets that facilitate engagement with entrepreneurial concepts (Barba-Sánchez & Atienza-Sahuquillo, 2018; Zhang et al., 2014).

From the perspective of the Entrepreneurial Event Model (Shapiro & Sokol, 1982), Business and Engineering students may have possessed higher baseline levels of perceived feasibility, confidence in their ability to successfully execute entrepreneurial activities, which the program amplified through exposure to real-world entrepreneurial contexts. The program may have strengthened their perceived desirability for entrepreneurship by demonstrating how entrepreneurial principles connect to their existing domain knowledge, creating a reinforcing cycle that enhanced specific attitudinal dimensions. These findings provide nuanced support for the Entrepreneurial Event Model while revealing important boundary conditions. Results suggest that the internship program may have enhanced perceived feasibility more effectively for Business and Engineering students who already possessed relevant analytical and problem-solving skills, while students from other disciplines may have required more intensive interventions to

build foundational competencies before perceived feasibility could meaningfully increase.

The absence of significant overall program effects (H1 not supported) coupled with strong disciplinary interaction effects (H2 supported) presents an intriguing methodological finding. The MANOVA approach, which examined individual EAO subscales separately, detected significant college-level variation that became completely obscured in regression analyses using composite scores. This divergence underscores the importance of employing multiple analytical strategies in program evaluation research, as reliance on global measures alone may mask meaningful heterogeneity. The pattern suggests that entrepreneurship education may influence different facets of entrepreneurial attitude through distinct mechanisms that vary by disciplinary context. The notably low correlations between Self-Esteem and other EAO subscales ( $r = -.19$  to  $.06$ ) further challenge the assumption that entrepreneurial attitudes operate as a unified construct, suggesting instead that entrepreneurial self-confidence may develop through different pathways than achievement orientation, innovation preference, or perceived control.

The failure to detect program manager effects (H3 not supported) contradicts expectations based on mentorship literature. Several explanations merit consideration. First, the binary operationalization of program manager presence (pre/post hiring) may have proven too crude to capture the nuanced ways mentorship influences student development. Students likely varied considerably in their actual engagement with the program manager, the quality of their interactions, and their perception of the manager's credibility and relevance to their goals. Second, program manager effects may manifest over longer time horizons than the immediate post-program assessment captured, as mentorship relationships often produce delayed benefits that emerge as students navigate subsequent career decisions.

The lack of significant change in Entrepreneurial Intention from pre-test to post-test, despite some attitudinal shifts, suggests a more complex relationship between educational interventions and intention formation than linear models typically assume. This finding aligns with recent research emphasizing the distinction between entrepreneurial intention and entrepreneurial implementation intention, with the latter representing a more proximal predictor of actual venture creation (Haddoud et al., 2024). Short-term educational programs may enhance specific knowledge domains and attitudinal dimensions without fundamentally altering career intentions, particularly among students who began the program with clear alternative career trajectories aligned with their primary academic disciplines. The moderate correlation between EAO and EI ( $r = .41-.44$ ) confirms theoretical linkages between attitudes and intentions, but also indicates that attitudes account for less than 20% of variance in intention, leaving substantial room for other influences including social norms, prior entrepreneurial exposure, economic opportunities, and personal circumstances (Liñán & Fayolle, 2015).

## Practical Implications

The significant disciplinary variation in program effectiveness suggests that a “one-size-fits-all” curriculum may inadequately serve diverse student needs (do Paço & Alves, 2024). Program designers should consider implementing differentiated approaches that provide discipline-specific scaffolding while maintaining a common core of entrepreneurial concepts. For students from Business and Engineering backgrounds, curricula might emphasize advanced applications, accelerated pacing, and opportunities to serve as peer mentors, leveraging their stronger baseline entrepreneurial orientation. For students from Education, Arts & Sciences, and Fine Arts, programs should explicitly bridge entrepreneurial concepts to their disciplinary contexts, using examples and case studies from their fields, addressing discipline-specific barriers to entrepreneurial self-efficacy, and providing additional foundational support in areas like financial analysis or market assessment where their prior training may have provided limited preparation.

Beyond curricular content, the findings highlight the importance of program evaluation approaches that capture heterogeneity in student outcomes. Administrators and funders increasingly demand evidence of program effectiveness, but aggregate metrics may obscure important variation in who benefits and how (Cumberland et al., 2024). Evaluation frameworks should systematically examine outcomes across student subgroups defined by academic discipline, prior entrepreneurial exposure, and demographic characteristics. The methodological lesson from this study—that subscale-level analyses revealed effects invisible in composite measures—also suggests that program evaluators should employ multidimensional assessments rather than relying solely on global outcome indicators.

## Theoretical Implications

This study extends the Entrepreneurial Event Model (Shapiro & Sokol, 1982) by providing empirical evidence for the boundary conditions of entrepreneurship education effectiveness. While the model identifies perceived desirability and perceived feasibility as universal antecedents to entrepreneurial intention, the current findings suggest that educational interventions designed to enhance these constructs may operate through discipline-specific mechanisms. Students from different academic backgrounds appear to possess distinct cognitive frameworks, skill sets, and baseline levels of entrepreneurial self-efficacy that moderate how they process and internalize entrepreneurial concepts. The finding that Business and Engineering students showed greater attitudinal gains suggests they may have entered the program with higher perceived feasibility, which the curriculum then reinforced and expanded, creating a “rich get richer” dynamic that amplified existing advantages. This pattern implies that perceived desirability and perceived feasibility exist not merely as individual-level constructs but receive shaping by disciplinary socialization, professional norms, and field-specific opportunity structures that education programs must explicitly address.

The dimensional complexity revealed by divergent MANOVA and regression results also contributes to theoretical understanding of entrepreneurial attitudes as psychological constructs. The Robinson et al. (1991) Entrepreneurial Attitude Orientation framework conceptualizes attitudes as multidimensional but interrelated, yet the current findings—particularly the independence of Self-Esteem from other subscales—challenge assumptions of strong internal consistency across dimensions. This suggests that Achievement orientation, Personal Control beliefs, Innovation preference, and entrepreneurial Self-Esteem may develop through partially independent pathways and may respond differentially to educational interventions depending on disciplinary context. The pattern aligns with contemporary perspectives viewing entrepreneurial attitudes not as stable personality traits but as malleable cognitive schemas that respond to environmental influences and learning experiences.

## Limitations & Future Research

### Limitations

Several limitations warrant consideration. First, the relatively small sample size within some colleges (e.g., Education,  $n = 7-8$ ) may have limited statistical power to detect small effects. The single-institution design at a regional university raises questions about generalizability to other institutional contexts and student populations with different demographic compositions. Second, the study relied exclusively on self-report measures, which remain subject to social desirability bias and may not accurately reflect actual entrepreneurial behavior. The pre-test/post-test design captured only immediate program effects; longer-term longitudinal follow-up would prove necessary to determine whether observed attitudinal changes persist over time or translate into entrepreneurial action. Additionally, several EAO subscales fell slightly below the conventional .70 reliability threshold, suggesting measurement imprecision that may have attenuated observed effects.

The binary operationalization of program manager presence represents a crude proxy for mentorship quality and intensity, failing to capture nuanced variation in student-manager interaction frequency or relationship quality. Furthermore, selection bias may have influenced results, as students self-selected into the program and may have differed systematically from non-participants in motivation or prior entrepreneurial exposure. The study also lacked a true control group of students who did not participate in any entrepreneurship programming, limiting causal inference. Finally, our measurement approach focused exclusively on psychological outcomes without assessing actual entrepreneurial behavior such as venture creation or entrepreneurial career choices, which represent the ultimate outcomes of interest.

### Future Research

Future research should employ longitudinal designs that track participants for multiple years following program

completion to assess whether the observed disciplinary differences in attitudinal gains translate into differential rates of venture creation or entrepreneurial career choices. Larger multi-institutional studies encompassing diverse university types and geographic regions would strengthen generalizability and enable more sophisticated multilevel modeling that accounts for both individual and institutional factors. These studies should incorporate comparison groups of students who do not participate in entrepreneurship programming to strengthen causal inference and should measure actual entrepreneurial behaviors—such as business registrations or freelance activities—rather than relying solely on psychological measures.

Deeper investigation into the mechanisms underlying disciplinary variation represents a critical research priority. Qualitative studies employing interviews and focus groups could illuminate how students from different academic backgrounds interpret and apply entrepreneurial concepts, what specific barriers they encounter, and which pedagogical approaches they find most valuable. Experimental or quasi-experimental studies testing discipline-tailored curricula against generic approaches would provide direct evidence about the value of differentiated programming.

Finally, future research should develop more nuanced measurement approaches for program structural features, particularly mentorship and administrative support. Rather than binary indicators of program manager presence, studies should assess interaction frequency, relationship quality, and specific activities to understand which mentorship dimensions most strongly predict student outcomes. Investigation of potential moderators beyond academic discipline, including gender, race/ethnicity, socioeconomic status, and prior entrepreneurial exposure, would further specify the boundary conditions of entrepreneurship education effectiveness.

## Conclusion

This quasi-experimental study demonstrates that entrepreneurship education programs produce heterogeneous effects based on students' academic disciplines, with those from Business and Engineering backgrounds benefiting most on specific dimensions of entrepreneurial attitude—Achievement, Personal Control, and Reflection. While no overall program effects emerged when examining students in aggregate, the significant interaction between program participation and college affiliation reveals that disciplinary context fundamentally shapes how students engage with and benefit from entrepreneurship curricula. The complementary use of MANOVA and regression analyses proved essential for detecting these patterns, as sub-scale-level effects became completely obscured in composite-level analyses, highlighting the importance of multidimensional assessment in program evaluation research.

The findings underscore the need for entrepreneurship educators and program designers to move beyond one-size-fits-all approaches toward differentiated models that provide discipline-specific scaffolding while maintaining cross-disciplinary collaboration opportunities (Barber et

al., 2021). Programs should explicitly connect entrepreneurial concepts to students' disciplinary contexts, address field-specific barriers to entrepreneurial self-efficacy, and provide tailored support that builds on students' existing knowledge structures rather than assuming universal starting points. This approach aligns with emerging perspectives on contextually-appropriate entrepreneurship education, including considerations for regional and rural contexts (Zollet et al., 2024). The absence of program manager effects, while contrary to expectations, points to the complexity of mentorship influence and the need for more nuanced measurement approaches that capture relationship quality and engagement intensity.

Despite limitations including modest sample sizes within some colleges, reliance on self-report measures, and examination of only immediate program effects, this study advances understanding of the boundary conditions of entrepreneurship education effectiveness. Future research employing longitudinal designs, qualitative methods to understand student experiences, and more sophisticated measurement of program features will deepen understanding of how, why, and for whom entrepreneurship education works. As universities continue expanding entrepreneurship programming across disciplines, evidence-based insights into disciplinary variation will prove essential for optimizing resource allocation, maximizing student benefit, and cultivating the diverse entrepreneurial talent needed to address complex societal challenges.

## Acknowledgments

The authors thank the students who participated in the program and completed the surveys.

## Funding

This research received no specific grant from any funding agency. However, the program evaluated in this study received support from the Golden Leaf Foundation.

## Conflict of Interest

The authors declare no conflicts of interest.

## Data Availability

The data that support the findings of this study remain available from the corresponding author upon reasonable request, subject to institutional review board approval.

## Funding Disclosure Statement

This work was supported by the NC Golden LEAF Foundation under the RISE29 internship program. The funder had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

## Conflict of Interest Statement

The authors declare that they have no conflicts of interest.

## IRB Approval

This study was approved by the University and Medical Center Institutional Review Board at East Carolina University (Protocol #UMCIRB 20-001664).

Submitted: January 06, 2026 MDT. Accepted: March 31, 2026 MDT. Published: September 08, 2026 MDT.



This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CCBY-4.0). View this license's legal deed at <http://creativecommons.org/licenses/by/4.0> and legal code at <http://creativecommons.org/licenses/by/4.0/legalcode> for more information.

## References

- Bae, T. J., Qian, S., Miao, C., & Fiet, J. O. (2014). The relationship between entrepreneurship education and entrepreneurial intentions: A meta-analytic review. *Entrepreneurship Theory and Practice*, 38(2), 217–254. <https://doi.org/10.1111/etap.12095>
- Barba-Sánchez, V., & Atienza-Sahuquillo, C. (2018). Entrepreneurial intention among engineering students: The role of entrepreneurship education. *European Research on Management and Business Economics*, 24(1), 53–61. <https://doi.org/10.1016/j.iiedeen.2017.04.001>
- Barber, D., III. (2015). An experimental analysis of risk and entrepreneurial attitudes of university students in the USA and Brazil. *Journal of International Entrepreneurship*, 13(4), 370–389. <https://doi.org/10.1007/s10843-015-0157-6>
- Barber, D., III, Saadatmand, Y., & Kavoori, T. (2016). Gender and financial risk: The U.S. and Brazil. *Studies in Business and Economics*, 11(1), 15–25. <https://doi.org/10.1515/sbe-2016-0002>
- Barber, D., III, Winkler, C., ... Winkel, D. (2021). Editorial: Special issue on interdisciplinary and experiential entrepreneurship education. *Entrepreneurship Education and Pedagogy*, 4(2), 96–99. <https://doi.org/10.1177/2515127421992519>
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum Associates.
- Cumberland, D. M., Kerrick, S. A., Cocco, A. R., & Tapolsky, M. A. (2024). Entrepreneurship program evaluation: Examining the impact of a training program on women and underrepresented groups. *Small Business Institute Journal*, 20(2), 1–8. <https://doi.org/10.53703/001c.125681>
- do Paço, A., & Alves, H. (2024). Entrepreneurship education for non-business students: A social learning perspective. *The International Journal of Management Education*, 22(2), 100945. <https://doi.org/10.1016/j.ijme.2024.100945>
- Duong, C. D., & Le, T. H. (2021). Entrepreneurial education and entrepreneurial intentions: The mediating role of self-efficacy and the moderating role of perceived social support. *International Journal of Management Education*, 19(3), 100573. <https://doi.org/10.1016/j.ijme.2021.100573>
- Fayolle, A., & Gailly, B. (2008). From craft to science: Teaching models and learning processes in entrepreneurship education. *Journal of European Industrial Training*, 32(7), 569–593. <https://doi.org/10.1108/03090590810899838>
- Fayolle, A., Gailly, B., & Lassas-Clerc, N. (2015). Assessing the impact of entrepreneurship education programmes: A new methodology. *Journal of European Industrial Training*, 30(9), 701–720. <https://doi.org/10.1108/03090590610715022>
- George, D., & Mallery, P. (2010). *SPSS for Windows step by step: A simple guide and reference*, 17.0 update (10th ed.). Pearson.
- Haddoud, M. Y., Onjewu, A.-K. E., & Nowiński, W. (2024). Entrepreneurial implementation intention: The role of psychological capital and entrepreneurship education. *The International Journal of Management Education*, 22(2), 100968. <https://doi.org/10.1016/j.ijme.2024.100968>
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed.). Pearson.
- Kember, D., Leung, D. Y., Jones, A., Loke, A. Y., McKay, J., Sinclair, K., Tse, H., Webb, C., Wong, F. K., Wong, M., & Yeung, E. (2000). Development of a questionnaire to measure the level of reflective thinking. *Assessment & Evaluation in Higher Education*, 25(4), 381–395. <https://doi.org/10.1080/713611442>
- Liñán, F. (2004). Intention-based models of entrepreneurship education. *Piccola Impresa/Small Business*, 3(1), 11–35.
- Liñán, F., & Chen, Y. W. (2009). Development and cross-cultural application of a specific instrument to measure entrepreneurial intentions. *Entrepreneurship Theory and Practice*, 33(3), 593–617. <https://doi.org/10.1111/j.1540-6520.2009.00318.x>
- Liñán, F., & Fayolle, A. (2015). A systematic literature review on entrepreneurial intentions: Citation, thematic analyses, and research agenda. *International Entrepreneurship and Management Journal*, 11(4), 907–933. <https://doi.org/10.1007/s11365-015-0356-5>
- Martin, B. C., McNally, J. J., & Kay, M. J. (2013). Examining the formation of human capital in entrepreneurship: A meta-analysis of entrepreneurship education outcomes. *Journal of Business Venturing*, 28(2), 211–224. <https://doi.org/10.1016/j.jbusvent.2012.03.002>
- Robinson, P. B., Stimpson, D. V., Huefner, J. C., & Hunt, H. K. (1991). An attitude approach to the prediction of entrepreneurship. *Entrepreneurship Theory and Practice*, 15(4), 13–31. <https://doi.org/10.1177/104225879101500405>
- Schlaegel, C., & Koenig, M. (2014). Determinants of entrepreneurial intent: A meta-analytic test and integration of competing models. *Entrepreneurship Theory and Practice*, 38(2), 291–332. <https://doi.org/10.1111/etap.12087>
- Shapero, A., & Sokol, L. (1982). The social dimensions of entrepreneurship. In C. A. Kent, D. L. Sexton, & K. H. Vesper (Eds.), *Encyclopedia of entrepreneurship* (pp. 72–90). Prentice Hall.
- Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics* (6th ed.). Pearson.
- Wang, C. K., Wong, P. K., & Lu, Q. (2011). Entrepreneurial intentions and venture creation: A comparison of Chinese and US university students. *Journal of Small Business and Entrepreneurship*, 24(3), 433–447. <https://doi.org/10.1080/08276331.2011.10593548>

Zhang, Y., Duysters, G., & Cloudt, M. (2014). The role of entrepreneurship education as a predictor of university students' entrepreneurial intention. *International Entrepreneurship and Management Journal*, 10(3), 623–641. <https://doi.org/10.1007/s11365-012-0246-z>

Zollet, S., Monsen, E., Chen, W. D., & Barber, D., III. (2024). Rural entrepreneurship education. *Entrepreneurship Education and Pedagogy*, 7(3), 409–415. <https://doi.org/10.1177/25151274241235458>