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# Mediation roles of pedagogical approaches and personality traits in entrepreneurial curriculum design and entrepreneurial intention nexus

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## Abstract

Planned behaviour theory was used in a path analysis modelling to investigate the serial mediation role of teaching methods and personality traits (locus of control, need for achievement and entrepreneurial attitude) in the relationship between entrepreneurship curriculum and entrepreneurial intention among university students in Ghana. A proposed 40-item instrument was used to measure outcomes for six constructs (3 personality trait constructs, entrepreneurship curriculum, teaching methods and entrepreneurial intention) for 324 participants. Acceptable convergent, divergent and construct validity scores were observed for the instrument. Teaching methods fully mediated the first-order relationships between entrepreneurial curriculum and each personality traits. The three constructs of personality traits parallelly mediated the second-order relationship between teaching methods and entrepreneurial intention. Teaching methods and each personality trait serially mediated the relationship between entrepreneurial curriculum and entrepreneurial intention. This empirical evidence provides insight into the design of pragmatic interventions by major stakeholders including entrepreneurship educators to inspire students into start-up activities

**Keywords** Entrepreneurship curriculum · Entrepreneurial intention · Mediation · Personality traits · Teaching methods

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## Introduction

Most developing economies of the world are yet to enjoy the full socioeconomic development prospects of entrepreneurship education and entrepreneurial behaviour intention linkage (Morris et al., 2020; Santos et al., 2019). University-based entrepreneurship education is in pursuance of further developing and sustaining students' knowledge, skills, attitudes and other characteristics (KSAOs) for actualisation of their entrepreneurial behaviour intentions (Asitik & Nunfam, 2019; Hien & Cho, 2018; Neck & Corbett, 2018; Santos et al., 2019). Its impacts on entrepreneurial behaviour goals relate to facilitating students' capacity to identify prospects to create, innovate and sustainably manage pioneering and existing business ventures (Kuratko & Morris, 2018; Lavelle, 2021; Liguori et al., 2018). It also leads to empowering students' potential capability to ultimately create opportunities for jobs and prosperity, engender sustainable community development and attenuate antithetical socioeconomic development (Santos et al., 2019; Schindehutte & Morris, 2016).

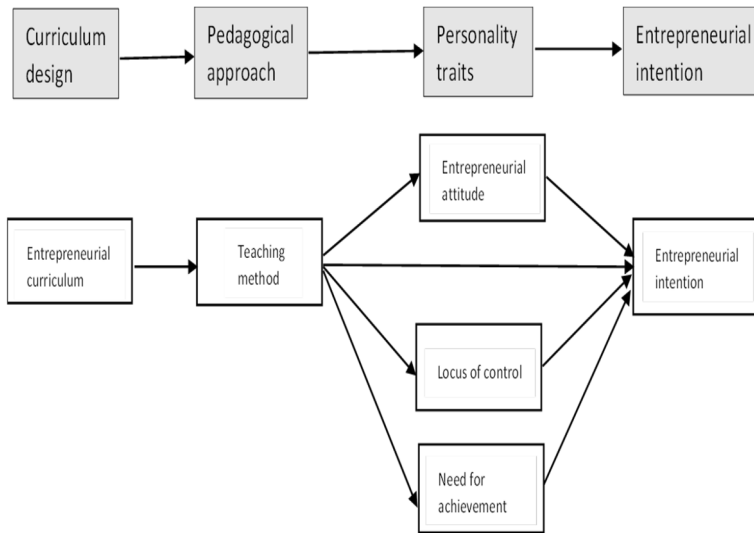
For this reason, evidence of theoretical literature and empirical studies on the linkage between entrepreneurship education, personality characteristics and entrepreneurial intention have evolved (Caliendo et al., 2014; Frank et al., 2007; Nunfam et al., 2022; Zhao et al., 2010). Meanwhile, findings on how entrepreneurship education influences personality traits-entrepreneurship intention discourses have yielded varied and inconsistent results in both developed and developing economies (Bae et al., 2014; Nunfam et al., 2022; Vodă & Florea, 2019; Zhao et al., 2010). There is also an evolving trend towards assessing the relationship between entrepreneurship education and entrepreneurial intention and how this linkage is mediated and/or moderated by several factors (e.g., psychological traits and self-efficacy) among university students (Jiatong et al., 2021; Ndofirepi, 2020; Zhao et al., 2005). The concepts involved are complex and providing empirical information on the conceptual understanding and the functional conditions for cross-cultural adaptation and other research interests can be challenging (Beaton et al., 2000; Liñán & Chen, 2009).

For example, assessing the nexus between entrepreneurship curriculum and entrepreneurial intention and how personality traits and teaching methods facilitate the linkage in different cultural settings have not been adequately explored and modelled. A mediation modelling approach is significant in unearthing the extent to which entrepreneurship curriculum influences entrepreneurial intention of students. Our study sought to accentuate verifiable evidence on the parallel and serial mediation role of personality traits (such as locus of control, need for achievement and entrepreneurial attitude) and teaching methods in the relationship between entrepreneurship curriculum and entrepreneurial intention. It also aims to have valuable theoretical and applied ramifications for entrepreneurship education and training programmes as well as entrepreneurial intention research to apprise and hone policy decisions and implementation. It will also rekindle researchers' interest in measuring students' perceptions of the connection between personality traits, entrepreneurship curriculum, teaching methods and entrepreneurial intention.

## Theoretical model and hypotheses development

Cognisance of extant literature on intention behaviour theoretical frameworks, Ajzen's theory of planned behaviour (TPB) was found as the most suitable conceptual foundation of this study. TPB operates on the assumption that entrepreneurship intention is the linear function of attitude, subjective norm and perceived behaviour control (Ajzen, 1991, 2005). Personal attitude connotes the extent to which an individual assesses and perceives a behaviour intention (e.g., taking initiative to start a new business) as favourable or unfavourable (Ajzen, 1991, 2005). Thus, the more optimistic an individual is regarding the outcome of initiating the activities of creating a new business, the more positive their attitude will be towards such behaviour, which then culminates into a stronger intent to engage in that activity. Subjective norm describes a person's perception of social influence to act or not to act on a specific behaviour. This behaviour is centred on beliefs about whether significant others approve or disapprove of an individual's intention to create a new business, and to what degree this approval or disapproval is relevant to the individual (Ajzen, 1991, 2005). Thus, the more the view of a significant other matters to the individual, the stronger the intention of the individual to engage in that activity. Perceived behavioural control refers to an individual's perception of how easy or difficult a given behaviour can be performed (Ajzen, 1991, 2005). An individual's perception of control over a behaviour depends on their self-control beliefs about the presence or absence of resources and prospects for acting on a behaviour intention. The better the perceived behavioural control over initiating the process of creating a new business, the greater the intention of the individual to engage in that activity (Ajzen, 1991, 2005).

Ajzen's TPB was adapted as the basis to explain students' entrepreneurial intention as the direct function of entrepreneurship curriculum and how students' background characteristics (e.g., age, gender and programme of study) affect this linear linkage (Krueger Jr et al., 2000; Nunfam et al., 2022; Shepherd & Krueger, 2002). As a significant theory, TPB has been widely adopted and/or adapted in several intention related empirical studies (Esfandiar et al., 2019; Gieure et al., 2020; Lavelle, 2021; Nunfam et al., 2022). However, the tenets of TPB render it inefficient and inapt in explaining entrepreneurship intention behaviour as a nonlinear process (Neck & Greene, 2011). Hence, TPB was modified and used to explain the conditions of conceptual models which require analysis based on indirect, mediation and/or moderation relationship among constructs (Brannback et al., 2007; Hayes, 2018). We adapted TPB to explain the direct relationship between entrepreneurship curriculum and entrepreneurial intention as well as the parallel and serial mediation role of teaching methods, entrepreneurial attitude, locus of control and need for achievement in this relationship. Our modified model operates on the premise that teaching methods, entrepreneurship attitude, locus of control and need for achievement mediates (i.e., parallelly and serially) the direct relationship between entrepreneurship curriculum (IV) and entrepreneurial intention (DV) of students (Fig. 1).



**Fig. 1** Conceptual model for parallel and serial mediation

## Entrepreneurship curriculum, teaching methods and personality traits

The actualisation of concrete entrepreneurial behaviour intention of students depends on the calibre of entrepreneurship education based on innovative entrepreneurship curriculum, practical oriented pedagogical approach, and the students' personality traits (Arranz et al., 2017; Nunfam et al., 2022; Piperopoulos & Dimov, 2015; Souitaris et al., 2007). In the context of entrepreneurship education, theoretical and empirical studies have demonstrated the interrelationship between entrepreneurship curriculum, teaching methods and specific personality traits constructs (e.g., attitude, need for achievement, risk taking propensity, locus of control and creativity) (Liguori et al., 2018; Ndofirepi, 2020; Nunfam et al., 2022; Piperopoulos & Dimov, 2015). Empirically, several studies have shown that entrepreneurship curriculum has significant positive influence on personality traits, teaching methods significantly relate to entrepreneurship curriculum and teaching methods significantly affect personality traits (e.g., entrepreneurship attitude) (Nunfam et al., 2022). However, the extent to which teaching methods mediate the relationship between entrepreneurship curriculum and entrepreneurial attitudes, need for achievement and locus of control is without adequate empirical evidence. Therefore, it is important to test the veracity of the following hypotheses in terms of serial mediation effect of teaching methods:

**H1** Teaching methods mediate the relationship between entrepreneurship curriculum and entrepreneurial attitude.

**H2** Teaching methods mediate the relationship between entrepreneurship curriculum and locus of control.

**H3** Teaching methods mediate the relationship between entrepreneurship curriculum and need for achievement.

**H4** Teaching methods mediate the relationship between entrepreneurship curriculum and entrepreneurial intention.

### **Entrepreneurship curriculum, teaching methods, personality traits and entrepreneurial intention**

Conceptual and empirical studies have shown that entrepreneurship education defined by entrepreneurship curriculum, teaching approach and personality traits tend to affect students' entrepreneurial behaviour intention (Ajzen, 1991; Bandura, 1989, 2018; Nunfam et al., 2022; Piperopoulos & Dimov, 2015). Consistent with the theories of planned behaviour (Ajzen, 1991), social cognitive (Bandura, 1989, 2018) and human capital (Schultz, 1980), subjective norms, perceived behaviour control, locus of control, need for achievement, self-efficacy, knowledge, skills and attitudes evident in curricula for entrepreneurship have the proclivity to shape students' entrepreneurial goal intention (Liguori et al., 2018; Ndofirepi, 2020; Nunfam et al., 2022). Similarly, studies of empirical perspectives have demonstrated that psychological and/or personality traits (e.g., attitude, locus of control, need for achievement and self-efficacy) significantly influence entrepreneurial intention (Ndofirepi, 2020; Nunfam et al., 2022; Vodă & Florea, 2019). Furthermore, teaching methods (e.g., interactive and learner centred approach) significantly affect entrepreneurial curriculum (Nunfam et al., 2022) and entrepreneurship intention and behaviour (Asitik & Nunfam, 2019; Mwasalwiba, 2010; Varamäki et al., 2015).

In the context of mediation and/or moderation analysis, varied results have been reported. For example, of three psychological traits (e.g., need for achievement, risk taking propensity and locus of control), only need for achievement had a partial mediation effect in the relationship between entrepreneurship education and entrepreneurial goal intention of students (Ndofirepi, 2020). Furthermore, a moderation mediation path analysis indicated empirical evidence of a significant direct and indirect effect of entrepreneurial attitude on entrepreneurial intention based on the moderation effect of teaching method through the mediation mechanism of entrepreneurial curriculum (Nunfam et al., 2022). However, there is inadequate empirical evidence of serial mediation effect of teaching methods and personality traits (measured at the parallel construct of need for achievement, entrepreneurial attitude and locus of control) in the relationship between entrepreneurship curriculum and entrepreneurial behaviour intention of students in the cultural context of Ghana as a developing economy. It is, therefore, imperative to test the following serial mediation hypotheses:

**H5** Teaching methods and entrepreneurial attitude serially mediate the relationship between entrepreneurship curriculum and entrepreneurial intention.

**H6** Teaching methods and locus of control serially mediate the relationship between entrepreneurship curriculum and entrepreneurial intention.

**H7** Teaching methods and need for achievement serially mediate the relationship between entrepreneurship curriculum and entrepreneurial intention.

## Materials and methods

### Research design, population, and sampling procedure

Pursuant to the positivist methodological worldview, we used an explanatory cross-sectional research approach to examine the research problem at a specific point in time (Creswell & Creswell, 2017; Sarantakos, 2012). Responses derived from a self-reported survey of final year students of both Takoradi Technical University (TTU) and University for Development Studies (UDS) in 2018 were used to evaluate teaching methods, personal attitudes, locus of control and need for achievement as parallel and serial mediators of the association between entrepreneurship curriculum and entrepreneurial intention of university students in Ghana (Creswell & Clark, 2017; Mertens, 2015). Based on an estimated population size (1717) involving 1217 and 500 final year students of TTU and UDS, respectively, a sample size (375) participants were determined (Krejcie & Morgan, 1970). The eligible students were randomly selected after expressing their interest and willingness based on informed consent to participate in the study. Eligible participants were final year students who had never own or commenced a business and had previously studied at least an entrepreneurial-related course or programme in either TTU or UDS. This category of students was favoured as they were almost finishing their undergraduate studies, had a higher motivation of nurturing their intents for entrepreneurship and potential to start a business. However, the study excluded students in other universities and year groups except final years, had no entrepreneurial intentions, never offered an entrepreneurial-related course or programme and had started a business. Subsequently, we recorded a response rate (86.4%) after retrieving 324 validly completed questionnaires out of the 375 questionnaires distributed to the participants (Nunfam et al., 2022). Subsequently, a total of 324 final year undergraduate students from two public universities participated in the study. Table 1 presents their demographic profile. Approximately 69% of the respondents were between the ages of 21 and 25. Majority (~64%) of the participants were males. Business programme was the most (~56%) common course of study among the respondents.

### Data sources, instrument, and measures

Primary data were used for this study. Likert scale questionnaire was used to elicit self-reported data on entrepreneurship curriculum, teaching methods, personal attitudes, locus of control, need for achievement and entrepreneurial intention as well as participants' demographics from March to June 2018. The

**Table 1** Background characteristics of respondents ( $n = 324$ ) *Source* Field survey, 2018

Characteristics	Total (%)	University	
		UDS (%)	TTU (%)
<i>Age</i>			
Below 20	48(14.8)	32(66.7)	16(33.7)
21–25	223(68.8)	55(24.7)	168(75.3)
26–30	45(13.9)	23(51.1)	23(13.9)
Above 30	8(2.5)	6(75.0)	2(25.0)
$\chi^2(3) = 40.776, p < 0.001, v = 0.355$			
<i>Gender</i>			
Male	208(64.2)	82(39.4)	126(60.6)
Female	116(35.8)	33(28.4)	83(71.6)
$\chi^2(1) = 3.918, p = 0.053$			
<i>Programme of study</i>			
Business	181(55.9)	43(23.8)	138(76.2)
Management	63(19.4)	44(69.8)	19(30.2)
Electrical Engineering	17(5.2)	0(0.0)	17(100.0)
Entrepreneurship and Economics	27(8.3)	27(100.0)	0(0.0)
Construction/Building Technology	1(0.3)	0(0.0)	1(100.0)
Mechanical Engineering	32(9.9)	0(0.0)	32(100)
Accounting	3(0.9)	0(0.0)	3(100.0)

validity of the adapted questionnaire items from face value was determined by co-researchers, field research assistants and potential respondents as appropriate, though with minor revisions to few items. Entrepreneurship education expert review showed the items were adequate, exhaustive; and apt in measuring the constructs they purport to measure, however with slight adjustments to few items for further succinctness. For the purposes of reducing common method bias (e.g., consistency pattern, response sequence bias and social desirability), we employed common remedies (e.g., designed reverse score items, avoided ambiguous question items and informed participants of response anonymity and confidentiality) (Podsakoff et al., 2003, 2012). We also pretested the questionnaire with 25 students which culminated into additional but minor adjustment to items which had low internal consistency. Before data collection, we obtained ethics approval from the Human Research Ethics Board of UDS and individual consent from respondents. It took respondents not less than 30 min to complete the self-reported questionnaire at convenient times which did not affect their lecture times (e.g., before or after lectures and weekends). The safety of the responses was provided to further guarantee the ethical obligation of respondents' privacy and anonymity. Each item was measured on a five-point Likert scale ranging from Strongly Disagree to Strongly Agree with scores from 1 to 5 correspondingly. Ultimately, the questionnaire employed 60 items to elicit information on the six constructs, namely entrepreneurship curriculum (9 items), teaching methods (9 items), entrepreneurial attitude (13 items), locus of control (8 items), need for achievement (9 items)



and entrepreneurial intention (12 items) excluding participants' demographics (Leong, 2008; Schwarz et al., 2009).

## Data analysis

Frequencies and percentages were used to describe the distributions across some characteristics of the study population. The Shapiro–Wilk and Henze–Zirkler tests were used to test univariate and multivariate normality, respectively. Sample adequacy and homogeneity of variance across samples taken from the two universities were assessed using Kaiser–Meyer–Olkin (KMO) statistic and the Bartlett's test of sphericity. Cronbach's alpha was used to investigate the reliability of the items for the various constructs considered. The average variance extract (AVE) and Fornell–Larker Criterion (LFC) were used to assess the convergent and discriminant validity of the instrument. The partial least square structural equation model (PLS-SEM) was used to estimate the conceptual model. SEM is applicable in establishing cause-and-effect outcomes (Afrifa-Yamoah, 2016). Model fit is reported using chi-square test, comparative fit index (CFI), root mean square error of approximation (RMSEA) and Tucker-Lewis Index (TLI). We further calculated the composite reliability (CR) statistics to establish the construct validity or otherwise of the instrument used. A probability value (*p value*) of less than 0.05 was deemed statistically significant. Statistical analysis was conducted using SmartPLS 3 (Ringle et al., 2015). Nonparametric bootstrapping analyses were deployed to test the mediational models based on estimates obtained from 1000 bootstrapped samples.

## Results

### Procedural remedies

The sample adequacy was confirmed based on the KMO score  $0.743 > 0.5$ . The Bartlett's test of sphericity had a  $p < 0.001$ , indicating that the data diverged significantly from identity matrix and can undergo data reduction. Shapiro–Wilk test (all  $p > 0.05$ ) revealed that the measurement items were normally distributed. Treating the measurement items as a multivariate dataset, Henze–Zirkler test ( $p > 0.05$ ) established that they are multivariate normally distributed. Therefore, maximum likelihood estimation approach was employed for the model parameters. The presence of common variance bias was assessed using the Herman's single factor test. The outcome revealed that the maximum variance explained by a single factor was 38.94% (which is less than 50%), indicating that common variance bias is not present in the dataset.

### Reliability and validity checks

Of the 60 items, 20 non-significant measurement items (all with low factor loadings ( $< 0.60$ ) and  $p > 0.05$ ) were removed from the model across the six measured

constructs (Gefen & Straub, 2005). The items removed from each construct were as follows: entrepreneurship curriculum (1 item), teaching methods (1 item), entrepreneurial attitude (6 items), locus of control (4 items), need for achievement (3 items) and entrepreneurial intention (5 items). Table 2 presents the standardised factor loadings for the confirmatory factor analysis (CFA) model, all of which were statistically significant ( $p < 0.001$ ). The Cronbach's  $\alpha$  for the reliability of the instrument was 0.927. The internal consistency of the extracted domains was good with Cronbach's  $\alpha$  and composite reliability (CR) statistics lying between  $0.7 < \alpha < 0.9$  (Table 3). Convergent validity was achieved across all the five domains, as their observed average variance extract (AVE) scores were greater than 0.5. The Fornell-Larcker Criterion (FLC) scores indicate that the inter-construct correlation estimates were all lower than the square-root of the respective AVE for the domains (main diagonal values of Table 2), confirming divergent validity. Additionally, the measurement model had a good fit ( $\chi^2(298) = 142.98$ ,  $p$  value = 0.378), as indicated by CFI = 0.912 ~ 0.90, TLI = 0.941 > 0.90, RMSEA = 0.062, and SRMR = 0.054 (95% CI: 0.049–0.058), both RMSEA and SRMR being within the cut-off value of 0.08.

### Testing the effects of IV on DV and evidence of mediation and serial mediation effects

The significance or otherwise of the hypotheses formulated were tested at 0.05 level of significance (Table 4). In assessing direct effects, we observed that entrepreneurship curriculum (critical ratio (CR) = 22.192,  $p < 0.001$ ) had significant effects on teaching method. Beyond entrepreneurship curriculum, teaching method was found to significantly affect positively locus of control (CR = 8.649,  $p < 0.001$ ), need for achievement (CR = 10.189,  $p < 0.001$ ) and entrepreneurial attitude (9.501,  $p < 0.001$ ), but not entrepreneurial intention (CR = 0.611,  $p < 0.001$ ). All personality traits measured constructs significantly affected entrepreneurial intention (all  $p < 0.05$ , see Table 4). Entrepreneurial curriculum explained 54.7% ( $R^2 = 0.547$ ) of the variability in teaching method. Teaching method explained 26.1%, 21.1% and 26.2% of the variabilities in need for achievement, locus of control and entrepreneurial attitude, respectively (Fig. 2).

In assessing the first-order mediation effects, teaching method fully mediated the relationships between entrepreneurial curriculum and personality traits (NA, LOC, and EA) (all  $p < 0.05$ ; Table 4). However, teaching method had no mediation effect on the relationship between entrepreneurial curriculum and intention ( $p = 0.543$ ). In assessing the second-order parallel mediation role of personality traits (NA, LOC, and EA), significant mediation effects were observed for all three traits for the relationship between teaching method and entrepreneurial intention (all  $p < 0.05$ ).

In assessing the serial mediation effect of entrepreneurship curriculum on intention, teaching method and personality traits (NA, LOC, and EA) fully serially mediated the relationship between entrepreneurship curriculum and entrepreneurial intention (all  $p < 0.05$ ; see Table 4). Overall, the serial mediation model explained approximately 60% ( $R^2 = 0.599$ ) of the variability in entrepreneurial intention.

**Table 2** Measurement items and their reliability *Source* Field survey, 2018

Constructs and their respective items	Loadings
<i>Entrepreneurship curriculum (CEC; Cronbach's alpha = 0.898, CR = 0.919, AVE = 0.588)</i>	
CEC_1—The entrepreneurship course is developed to meet the needs of the economy	0.656***
CEC_2—The subject entrepreneurship is interesting because of its interactive learning nature	0.715***
CEC_4—I gain new experience pursuing the entrepreneurship course	0.796***
CEC_5—I have acquired entrepreneurial skills through the course	0.834***
CEC_6—I have gained sound knowledge about business through the entrepreneurship course	0.817***
CEC_7—Entrepreneurship lessons are real-world situations	0.775***
CEC_8—The entrepreneurship course adequately cover content to guide dealing with uncertainty	0.773***
CEC_9—The entrepreneurship course adequately cover content to guide dealing with ambiguity	0.753***
<i>Teaching method (TM; Cronbach's alpha = 0.902, CR = 0.921, AVE = 0.595)</i>	
TM_1—Lecturers teach the entrepreneurship course to meet real-world needs	0.743***
TM_2—Lecturers demonstrate their experiences in teaching entrepreneurship courses	0.770***
TM_3—The methodologies used by lecturers to deliver the entrepreneurship courses are very interesting	0.776***
TM_5—Lecturers are approachable and have excellent ways of presenting the entrepreneurship courses	0.778***
TM_6—Lecturers presents a comprehensive business plan model that prepares me for the real-world of work	0.745***
TM_7—Lecturers teaching methodologies stimulate my interest in entrepreneurship course	0.827***
TM_8—The stories of great entrepreneurs told during lectures motivates me to develop interest in business ventures	0.763***
TM_9—The participatory nature of entrepreneurship lectures makes lessons engaging	0.789***
<i>Locus of control (LOC; Cronbach's alpha = 0.754, CR = 0.845, AVE = 0.581)</i>	
LOC_4—I like to try new things like visiting new places	0.753***
LOC_5—I tend to use new routes when I travel	0.633***
LOC_7—I am confident of my skills and abilities to start a business	0.825***
LOC_8—I will create my own business once an opportunity is detected	0.826***
<i>Need for achievement (NA; Cronbach's alpha = 0.868, CR = 0.901, AVE = 0.604)</i>	
NA_1—I am mentally prepared to become an entrepreneur	0.773***
NA_2—It is worth working hard to improve past performance	0.844***
NA_3—I will excel in fairly difficult task relating to my study and work	0.766***
NA_4—I have the acquired leadership skills to be an entrepreneur	0.755***
NA_7—I am responsible in finding solutions to my problems	0.779***
NA_9—I believe in life, one must aim high and so, take a higher-level risk	0.745***
<i>Entrepreneurial attitude (EA; Cronbach's alpha = 0.885, CR = 0.911, AVE = 0.598)</i>	
EA_3—I earn more when I am self-employed than being paid by an employer	0.663***
EA_6—As an entrepreneur, I must face many challenges unlike working as an employee	0.803***
EA_7—I need constant change to remain motivated, even if this would mean higher uncertainty	0.734***
EA_8—The university programs have developed me well to compete with other businesspersons	0.713***

**Table 2** (continued)

Constructs and their respective items	Loadings
EA_9—I must work hard in situations where my performance is compared against that of others	0.795***
EA_12—I feel excited when my work is judged among the best	0.815***
EA_13—I believe hard work will place me among the best in my field	0.871***
<i>Entrepreneurial intention (EI; Cronbach's alpha = 0.868, CR = 0.899, AVE = 0.562)</i>	
EI_2—I am likely to start my own business after completing my studies	0.770***
EI_3—I would prefer starting my own business to being a manager of an existing business	0.776***
EI_4—I can only make good money if I am self-employed	0.659***
EI_5—I would rather be the boss of my business than be a secured employee	0.820***
EI_6—I enjoy going through challenges to create a new business	0.733***
EI_7—I want the freedom to express myself in my own business	0.771***
EI_11—I admire those that succeed in running their own business	0.703***

\*\*\*Bootstrap *p* value < 0.05 indicating significance of item loading; CR—Composite Reliability

**Table 3** Discriminant validity analysis based on Fornell-Larcker Criterion (FLC) *Source* Field survey, 2018

Constructs	CEC	TM	LOC	NA	EA	EI
CEC	0.767					
TM	0.601	0.771				
LOC	0.157	0.269	0.762			
NA	0.396	0.378	0.435	0.777		
EA	0.326	0.456	0.291	0.388	0.773	
EI	0.383	0.536	0.349	0.471	0.399	0.750

CEC=Entrepreneurship curriculum; TM=Teaching method; LOC=Locus of control; EA=Entrepreneurial attitude; EI=Entrepreneurial intention

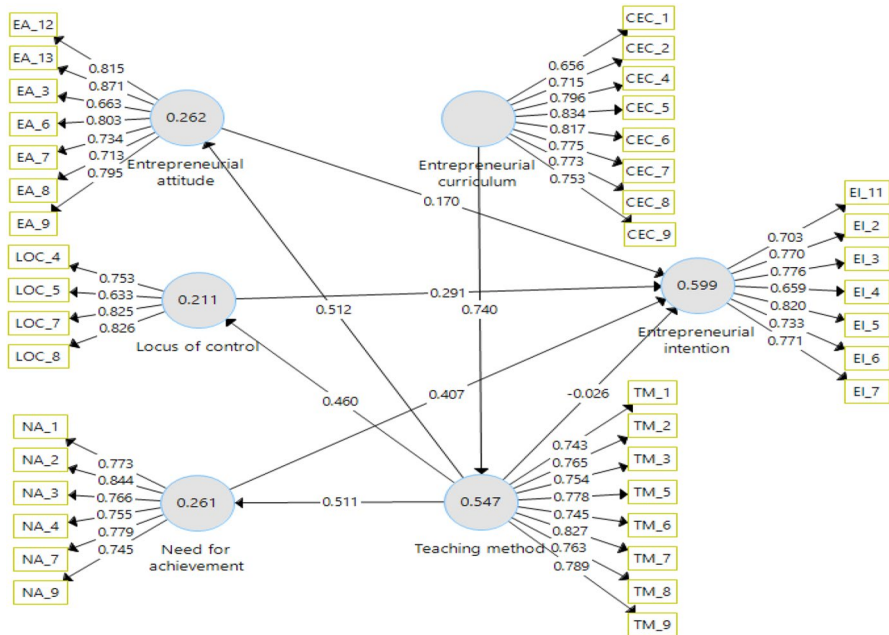
## Discussion

To the best of our knowledge, this is the first study to adapt Ajzen’s TPB in a modified conceptual model to assess the parallel and serial mediation roles of personality traits (i.e., LOC, NA and EA) and teaching methods in the relationship between entrepreneurship curriculum and entrepreneurial intention. The scope and direction of the adapted conceptual model provided the basis to empirically assess and explain the direct and indirect effects between entrepreneurship curriculum, teaching methods, personality traits and entrepreneurial intention. The path analysis showed that there was a significant direct effect of entrepreneurship curriculum on teaching methods. Teaching methods had direct significant influence on personality traits while the direct effects of personality traits on entrepreneurial intention were significant. In applying the conceptual model for parallel and serial mediation, we observed that teaching methods fully mediated the first-order relationships between entrepreneurial curriculum and personality

**Table 4** Bootstrapped regression weights and standard deviations for the fit of path model across study constructs and summary of hypotheses testing *Source* Field survey, 2018

Hypothesis	Standardised coefficients <i>Mean (SD); p value</i>	Remark
<i>Direct effects</i>		
Entrepreneurship curriculum → Teaching method	<b>0.742 (0.033); p &lt; 0.001</b>	Significant
Teaching method → Locus of control	<b>0.459 (0.054); p &lt; 0.001</b>	Significant
Teaching method → Need for achievement	<b>0.513 (0.050); p &lt; 0.001</b>	Significant
Teaching method → Entrepreneurial attitude	<b>0.516 (0.054); p &lt; 0.001</b>	Significant
Teaching method → Entrepreneurial intention	-0.026 (0.042); p = 0.541	Not significant
Locus of control → Entrepreneurial intention	<b>0.292 (0.061); p &lt; 0.001</b>	Significant
Need for achievement → Entrepreneurial intention	<b>0.404 (0.064); p &lt; 0.001</b>	Significant
Entrepreneurial attitude → Entrepreneurial intention	<b>0.175 (0.069); p = 0.014</b>	Significant
<i>Mediation effects</i>		
Entrepreneurship curriculum → Teaching method → Locus of control	<b>0.341 (0.047); p &lt; 0.001</b>	Supported
Entrepreneurship curriculum → Teaching method → Need for achievement	<b>0.381 (0.046); p &lt; 0.001</b>	Supported
Entrepreneurship curriculum → Teaching method → Entrepreneurial attitude	<b>0.383 (0.047); p &lt; 0.001</b>	Supported
Entrepreneurship curriculum → Teaching method → Entrepreneurial intention	-0.019 (0.031); p = 0.543	Not supported
Teaching method → Locus of control → Entrepreneurial intention	<b>0.134 (0.031); p &lt; 0.001</b>	Supported
Teaching method → Need for achievement → Entrepreneurial intention	<b>0.208 (0.039); p &lt; 0.001</b>	Supported
Teaching method → Entrepreneurial attitude → Entrepreneurial intention	<b>0.091 (0.038); p = 0.024</b>	Supported
<i>Serial &amp; parallel mediation effects</i>		
Entrepreneurship curriculum → Teaching method → Locus of control Entrepreneurial intention	<b>0.099 (0.023); p &lt; 0.001</b>	Supported
Entrepreneurship curriculum → Teaching method → Need for achievement → Entrepreneurial intention	<b>0.154 (0.032); p &lt; 0.001</b>	Supported
Entrepreneurship curriculum → Teaching method → Entrepreneurial attitude → Entrepreneurial intention	<b>0.067 (0.029); p = 0.026</b>	Supported

Bold numbers indicate significance at p-values <0.05



**Fig. 2** Parallel and serial mediation model linking entrepreneurship curriculum, pedagogical approach, personality traits and entrepreneurial intention. Standardised estimates are presented in evaluating the relationships

traits while personality traits also fully mediated (parallel mediation) the second-order relationship between teaching methods and entrepreneurial intention. Overall, the parallel and serial mediation model explained approximately 60% of the variability in entrepreneurial intention while the measurement model had an excellent goodness-of-fit indices.

Comparable studies in concurrence with our findings have reported adequate evidence of significant direct intercorrelation between entrepreneurship curriculum and teaching methods, and personality traits and entrepreneurial intentions (Ajzen, 1991; Liguori et al., 2018; Ndofirepi, 2020; Nunfam et al., 2022). For example, though our study found direct significant effect of entrepreneurship curriculum on teaching methods, teaching methods had a significant direct influence on entrepreneurship curriculum (e.g., Nunfam et al., 2022). As demonstrated in other studies (e.g., Nunfam et al., 2022) regarding the positive and significant correlation between teaching methods and personality traits (e.g., EA), our findings also accentuate the direct significant effect of teaching methods on personality traits (e.g., LOC, EA and NA). Similarly, our results on the direct significant influence of personality traits on entrepreneurial intentions mirror the research findings of comparable theoretical and empirical studies (e.g., Ajzen, 1991; Liguori et al., 2018; Ndofirepi, 2020; Nunfam et al., 2022; Vodă & Florea, 2019). Thus, entrepreneurship education and training policy and programme formulation and implementation based on the significant intercorrelation between entrepreneurship curriculum, teaching methods,

personality traits and entrepreneurial intention have the prospects of inspiring entrepreneurship behaviour of students.

Furthermore, our results provided adequate evidence in support of H1, H2 and H3 as teaching methods had a significant mediation effect on the relationship between entrepreneurship curriculum and personality traits. Comparably, preceding studies (see Nunfam et al., 2022) found a moderated mediation influence of teaching methods and entrepreneurship curriculum on the nexus of personality traits and entrepreneurial intention. This outcome indicates that entrepreneurship education curriculum tends to significantly affect students' personality traits via teaching methods (e.g., passive-driven or active-centred pedagogy). Entrepreneurship curriculum with student-centred teaching methods (e.g., workshop, industrial visits, business plan challenge, motivating students with stories of great entrepreneurs and participatory method of teaching) tends to shape students' attitudes, locus of control and need for achievements correspondingly (Asitik & Nunfam, 2019; Esmi et al., 2015; Mwasalwiba, 2010; Nunfam et al., 2022). Thus, the design of university entrepreneurship education policies and programmes underpinned by the significant role of teaching methods (e.g., student-oriented methods) have the high proclivity of facilitating the effect of entrepreneurship curriculum on personality traits of students (Nunfam et al., 2022).

Teaching methods had no significant mediation influence on the relationship between entrepreneurship curriculum and entrepreneurial intention as the evidence does not support H4. Prior studies (e.g., Nunfam et al., 2022) did not find any significant positive correlation between teaching methods and entrepreneurial intention or between entrepreneurship curriculum and entrepreneurial intention. This outcome shows that as significant as entrepreneurship curriculum and teaching methods may be in their application in the delivery of entrepreneurship education, they do not by themselves consistently and/or directly influence students' entrepreneurial intention unless they are contextually driven. Therefore, entrepreneurship education policies of university managers and educators ought to be informed by the strategic use of teaching methods in the delivery of entrepreneurship curriculum aimed at shaping students' entrepreneurship intention.

Moreover, significant correlation between entrepreneurship curriculum and teaching methods, teaching methods and entrepreneurial attitude and direct effect of entrepreneurial attitude on entrepreneurial intention have been exemplified and reported in prior studies (e.g., Ajzen, 2005; Nguyen et al., 2019; Nunfam et al., 2022). Consequently, we found that there was a significant positive indirect effect of entrepreneurship curriculum on entrepreneurial intention via teaching methods and each of the personality traits as the empirical evidence support H5, H6 and H7. These outcomes suggest that the extent to which students' entrepreneurial behaviour intention is significantly affected by entrepreneurship education curriculum depends on the facilitating mechanism of student-centred teaching methods which tend to influence their entrepreneurial attitude, internal and external locus of control and need for achievement. The more the pedagogical approach is influenced by student-centredness, the more it tends to facilitate students' entrepreneurial attitude which ultimately influences their entrepreneurial behaviour intention (Asitik & Nunfam, 2019; Ndofirepi, 2020; Nunfam et al., 2022). As highlighted in comparable studies

(Nunfam et al., 2022; Santokhie & Lipps, 2020; Vodă & Florea, 2019), our findings exemplify further evidence of significant relationship between entrepreneurship curriculum and teaching methods, teaching methods and locus of control and how locus of control directly affect entrepreneurial intention. In addition, the findings substantiate similar studies (e.g., Nasip et al., 2017; Ndofirepi, 2020; Nunfam et al., 2022; Vodă & Florea, 2019) which demonstrate the linkage between entrepreneurship curriculum and teaching methods, teaching methods and the need for achievement as well as the direct influence of the need for achievement on entrepreneurial intention.

The valuable contributions of this study are obvious in its innovative use of a conceptual model based on Ajzen's TPB to understand the parallel and serial mediation role of teaching methods and personality traits in the relationship between entrepreneurship curriculum and entrepreneurial behaviour intention. It also demonstrates the need for managers of higher educational institutions to have entrepreneurship education policies and programmes informed by student-centred pedagogical methods that influence personality traits which tend to increase students' entrepreneurial behaviour intention. Nevertheless, this study is also associated with the following notable limitations. Firstly, our study depended on self-reported viewpoints of respondents on the effect of entrepreneurship curriculum on entrepreneurial intention, and how this relationship is mediated by teaching methods and personality traits. We are mindful that this method of gathering data could result in the likelihood of recollection bias. Secondly, respondents of this study were limited to only two out of several universities located in Ghana. Thirdly, excluded from the survey were students in other universities and year groups except for final years, students who had no entrepreneurial intentions, never offered an entrepreneurial-related course or programme and had started a business. Lastly, considering the relatively limited scope and size of respondents exclusively to final year students in only two universities in Ghana, we were careful of potential concerns which could arise regarding the generalisation of the results to analogous cohort of university students. Hence, it was significant to remain cautious and avoid any inconsiderate attitude towards the interpretation of the results except there were several comparable studies which significantly validate our results.

## Conclusions and implications

The study has engendered significant policy and practical implications for literature on entrepreneurship curriculum, teaching methods, personality traits and entrepreneurial intention as well as for ambitious student entrepreneurs, entrepreneurship educators, university managers and policy decision-makers. First and foremost, we have enhanced extant literature on the direct and interactive effects among entrepreneurship curriculum, teaching methods, personality traits and entrepreneurial intention. Secondly, the practical connotation of our study for researchers is to adopt or adapt the novel conceptual model for parallel and serial mediation and the methodological approach in cross-cultural and/or complementary cohort studies as to stimulate further research interest in entrepreneurship-based education and entrepreneurial intention studies especially in the developing economies of Africa. Thirdly,



the outcome of the study on the effect of entrepreneurship curriculum on entrepreneurial intention, and how teaching methods and personality traits parallelly and serially mediate this relationship provides the basis for entrepreneurship educators, university managers and entrepreneurial policy decision-makers to inform their policy efforts to inspire potential student entrepreneurs into start-up activities. Finally, our study used the viewpoints of respondents to ascertain the effect of entrepreneurship curriculum on entrepreneurial intention, and how this relationship is mediated by teaching methods and personality traits. Further research can be conducted using moderation or mediated moderation approach with similar constructs to ascertain their direct and/or indirect effect on students' entrepreneurial behaviour. Also, further studies could expand the relatively limited scope of this study to include all categories of students in more universities beyond Ghana and not limit the survey to students in the final year in only two out of several universities. This will improve the confidence level of the results in its representativeness and generalisability.

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## Declarations

**Conflict of interest** The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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## References

- Afrifa-Yamoah, E. (2016). Achievement motivation as a function of participation, strive, willingness to work and maintaining work: Application of structural equation modelling (SEM). *International Journal of Psychology and Behavioural Sciences*, 6(3), 133–138. <https://doi.org/10.5923/j.ijpbs.20160603.06>

- Ajzen, I. (1991). The theory of planned behaviour. *Organisational Behaviour and Human Decision Processes*, 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Ajzen, I. (2005). *Attitudes, personality and behaviour*. McGraw-hill education.
- Arranz, N., Ubierna, F., Arroyabe, M. F., Perez, C., & Fdez de Arroyabe, J. (2017). The effect of curricular and extracurricular activities on university students' entrepreneurial intention and competences. *Studies in Higher Education*, 42(11), 1979–2008. <https://doi.org/10.1080/03075079.2015.1130030>
- Asitik, A. J., & Nunfam, V. F. (2019). Quality and relevance of entrepreneurial education in Ghana: Perspectives of Undergraduate Students. *UDS International Journal of Development*, 6(3), 41–56.
- 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>
- Bandura, A. (1989). Regulation of cognitive processes through perceived self-efficacy. *Developmental Psychology*, 25(5), 729.
- Bandura, A. (2018). Toward a psychology of human agency: Pathways and reflections. *Perspectives on Psychological Science*, 13(2), 130–136. <https://doi.org/10.1177/1745691617699280>
- Beaton, D. E., Bombardier, C., Guillemin, F., & Ferraz, M. B. (2000). Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine*, 25(24), 3186–3191. <https://doi.org/10.1097/00007632-200012150-00014>
- Brannback, M., Carsrud, A., Kickul, J., & Krueger, N. (2007). 'Watch out, Isaac!!'-re-constructing entrepreneurial intentions. <http://hdl.handle.net/1959.3/81018>.
- Caliendo, M., Fossen, F., & Kritikos, A. S. (2014). Personality characteristics and the decisions to become and stay self-employed. *Small Business Economics*, 42(4), 787–814. <https://doi.org/10.1007/s11187-013-9514-8>
- Creswell, J. W., & Clark, V. L. P. (2017). *Designing and conducting mixed methods research*. Sage publications.
- Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative quantitative and mixed methods approaches*. Sage publications.
- Esfandiari, K., Sharifi-Tehrani, M., Pratt, S., & Altinay, L. (2019). Understanding entrepreneurial intentions: A developed integrated structural model approach. *Journal of Business Research*, 94, 172–182. <https://doi.org/10.1016/j.jbusres.2017.10.045>
- Esmi, K., Marzoughi, R., & Torzadeh, J. (2015). Teaching learning methods of an entrepreneurship curriculum. *Journal of Advances in Medical Education & Professionalism*, 3(4), 172.
- Frank, H., Lueger, M., & Korunka, C. (2007). The significance of personality in business start-up intentions, start-up realisation and business success. *Entrepreneurship & Regional Development*, 19(3), 227–251. <https://doi.org/10.1080/08985620701218387>
- Gefen, D., & Straub, D. (2005). A practical guide to factorial validity using PLS-graph: Tutorial and annotated example. *Communications of the Association for Information Systems*, 16(5), 91–109.
- Gieure, C., del Mar Benavides-Espinosa, M., & Roig-Dobón, S. (2020). The entrepreneurial process: The link between intentions and behaviour. *Journal of Business Research*, 112, 541–548. <https://doi.org/10.1016/j.jbusres.2019.11.088>
- Hayes, A. F. (2018). Partial, conditional, and moderated moderated mediation: Quantification, inference, and interpretation. *Communication Monographs*, 85(1), 4–40. <https://doi.org/10.1080/03637751.2017.1352100>
- Hien, D. T. T., & Cho, S. E. (2018). Relationship between entrepreneurship education and innovative start-up intentions among university students. *International Journal of Entrepreneurship*, 22(3), 1–16. <https://doi.org/10.1186/s13731-020-0115-x>
- Jiatong, W., Murad, M., Bajun, F., Tufail, M. S., Mirza, F., & Rafiq, M. (2021). Impact of entrepreneurial education, mindset, and creativity on entrepreneurial intention: Mediating role of entrepreneurial self-efficacy. *Frontiers in Psychology*. <https://doi.org/10.3389/fpsyg.2021.724440>
- Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30(3), 607. <https://doi.org/10.1177/001316447003000308>
- Krueger, N. F., Jr., Reilly, M. D., & Carsrud, A. L. (2000). Competing models of entrepreneurial intentions. *Journal of Business Venturing*, 15(5–6), 411–432. [https://doi.org/10.1016/S0883-9026\(98\)00033-0](https://doi.org/10.1016/S0883-9026(98)00033-0)
- Kuratko, D. F., & Morris, M. H. (2018). Examining the future trajectory of entrepreneurship. *Journal of Small Business Management*, 56(1), 11–23. <https://doi.org/10.1111/jsbm.12364>
- Lavelle, B. A. (2021). Entrepreneurship education's impact on entrepreneurial intention using the theory of planned behavior: Evidence from Chinese vocational college students. *Entrepreneurship Education and Pedagogy*, 4(1), 30–51. <https://doi.org/10.1080/08276331.2018.1459016>
- Leong, C. K. (2008). *Entrepreneurial intention: An empirical study among Open University Malaysia (OUM) students*. Open University Malaysia (OUM).

- Liguori, E. W., Bendickson, J. S., & McDowell, W. C. (2018). Revisiting entrepreneurial intentions: A social cognitive career theory approach. *International Entrepreneurship and Management Journal*, 14(1), 67–78. <https://doi.org/10.1007/s11365-017-0462-7>
- 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.
- Mertens, D. M. (2015). *Mixed methods and wicked problems*. SAGE Publications.
- Morris, M. H., Santos, S. C., & Neumeyer, X. (2020). Entrepreneurship as a solution to poverty in developed economies. *Business Horizons*, 63(3), 377–390. <https://doi.org/10.1016/j.bushor.2020.01.010>
- Mwasalwiba, E. S. (2010). Entrepreneurship education: A review of its objectives, teaching methods, and impact indicators. *Education + Training*, 52(1), 20–47.
- Nasip, S., Amirul, S. R., Sondoh, S. L., Jr., & Tanakinjal, G. H. (2017). Psychological characteristics and entrepreneurial intention: A study among university students in North Borneo, Malaysia. *Education + Training*, 59(7/8), 825–840. <https://doi.org/10.1108/ET-10-2015-0092>
- Ndofirepi, T. M. (2020). Relationship between entrepreneurship education and entrepreneurial goal intentions: Psychological traits as mediators. *Journal of Innovation and Entrepreneurship*, 9(1), 1–20. <https://doi.org/10.1108/ET-10-2015-0092>
- Neck, H. M., & Corbett, A. C. (2018). The scholarship of teaching and learning entrepreneurship. *Entrepreneurship Education and Pedagogy*, 1(1), 8–41.
- Neck, H. M., & Greene, P. G. (2011). Entrepreneurship education: Known worlds and new frontiers. *Journal of Small Business Management*, 49(1), 55–70. <https://doi.org/10.1111/j.1540-627X.2010.00314.x>
- Nguyen, A. T., Do, T. H. H., Vu, T. B. T., Dang, K. A., & Nguyen, H. L. (2019). Factors affecting entrepreneurial intentions among youths in Vietnam. *Children and Youth Services Review*, 99, 186–193. <https://doi.org/10.1016/j.childyouth.2019.01.039>
- Nunfam, V. F., Asitik, A. J., & Afrifa-Yamoah, E. (2022). Personality, entrepreneurship education and entrepreneurial intention among Ghanaian students. *Entrepreneurship Education and Pedagogy*, 5(1), 65–88. <https://doi.org/10.1177/2515127420961040>
- Piperopoulos, P., & Dimov, D. (2015). Burst bubbles or build steam? Entrepreneurship education, entrepreneurial self-efficacy, and entrepreneurial intentions. *Journal of Small Business Management*, 53(4), 970–985. <https://doi.org/10.1111/jsbm.12116>
- Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879. <https://doi.org/10.1037/0021-9010.88.5.879>
- Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology*, 63, 539–569. <https://doi.org/10.1146/annurev-psych-120710-100452>
- Ringle, C. M., Wende, S., & Becker, J.-M. (2015). SmartPLS. Retrieved from <https://www.smartpls.com>.
- Santokhie, S., & Lipps, G. E. (2020). Development and validation of the tertiary student locus of control scale. *SAGE Open*, 10(1), 2158244019899061.
- Santos, S. C., Neumeyer, X., & Morris, M. H. (2019). Entrepreneurship education in a poverty context: An empowerment perspective. *Journal of Small Business Management*, 57, 6–32. <https://doi.org/10.1111/jsbm.12485>
- Sarantakos, S. (2012). *Social research*. Macmillan International Higher Education.
- Schindehutte, M., & Morris, M. H. (2016). The experiential learning portfolio and entrepreneurship education. In M. Morris & E. Liguori (Eds.), *Annals of entrepreneurship education and pedagogy – 2016* (pp. 161–175). Edward Elgar Publishing. <https://doi.org/10.4337/9781784719166.00015>
- Schultz, T. W. (1980). Investment in entrepreneurial ability. *The Scandinavian Journal of Economics*. <https://doi.org/10.2307/3439676>
- Schwarz, E. J., Wdowiak, M. A., Almer-Jarz, D. A., & Breitenacker, R. J. (2009). The effects of attitudes and perceived environment conditions on students' entrepreneurial intent: An Austrian perspective. *Education + Training*, 51(4), 272–291. <https://doi.org/10.1108/00400910910964566>
- Shepherd, D. A., & Krueger, N. F. (2002). An intentions-based model of entrepreneurial teams' social cognition. *Entrepreneurship Theory and Practice*, 27(2), 167–185.
- Souitaris, V., Zerbiniati, S., & Al-Laham, A. (2007). Do entrepreneurship programmes raise entrepreneurial intention of science and engineering students? The effect of learning, inspiration and resources. *Journal of Business Venturing*, 22(4), 566–591. <https://doi.org/10.1016/j.jbusvent.2006.05.002>

- Varamäki, E., Joensuu, S., Tornikoski, E., & Viljamaa, A. (2015). The development of entrepreneurial potential among higher education students. *Journal of Small Business and Enterprise Development*, 22(3), 563–589.
- Vodá, A. I., & Florea, N. (2019). Impact of personality traits and entrepreneurship education on entrepreneurial intentions of business and engineering students. *Sustainability*, 11(4), 1192. <https://doi.org/10.3390/su11041192>
- Zhao, H., Seibert, S. E., & Hills, G. E. (2005). The mediating role of self-efficacy in the development of entrepreneurial intentions. *Journal of Applied Psychology*, 90(6), 1265. <https://doi.org/10.1037/0021-9010.90.6.1265>
- Zhao, H., Seibert, S. E., & Lumpkin, G. T. (2010). The relationship of personality to entrepreneurial intentions and performance: A meta-analytic review. *Journal of Management*, 36(2), 381–404.

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