

Are Generation Z Born Entrepreneurs? Cognitive Mindset and Entrepreneurial Intention among Generation Z Undergraduate University Students

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ABSTRACT

Generation Z is expected to play a pivotal role in shaping future entrepreneurial ecosystems, yet little is known about how this cohort's cognitive mindset relates to entrepreneurial intention, particularly in developing economies. Drawing on Social Cognitive Theory and the metacognitive view of the entrepreneurial mindset (Haynie & Shepherd, 2009; Hisrich et al., 2022), this study examines the association between five cognitive mindset dimensions (goal orientation, metacognitive knowledge, metacognitive experience, metacognitive choice and monitoring) and entrepreneurial intention among Generation Z undergraduate university students. A quantitative, cross-sectional survey design was adopted. Data were collected through a structured 41-item questionnaire (35 cognitive mindset items and six entrepreneurial intention items) from 79 undergraduate students in ten countries, 84.8% of them in Egypt, selected through non-probability purposive sampling. The data were analysed using reliability testing, measurement-model assessment, Pearson correlation and multiple linear regression. The five cognitive mindset scales showed acceptable reliability (Cronbach's $\alpha = .756-.850$) but were strongly intercorrelated ($r = .641-.786$), with HTMT ratios of up to .996, indicating considerable overlap and limited discriminant validity. In a supplementary analysis, none of the five dimensions was significantly associated with self-reported business ownership (24.1% of respondents; $\chi^2(5) = 5.53$, $p = .355$). A cross-sectional survey cannot establish whether Generation Z is innately entrepreneurial. The study also contributes evidence from a sample in which Egypt, an under-researched context within the Middle East and North Africa (MENA) region, is strongly represented.

Keywords Cognitive mindset; Metacognition; Goal orientation; Entrepreneurial intention; Generation Z; University students

INTRODUCTION

In today's rapidly evolving economic landscape, entrepreneurship is no longer regarded solely as a career path but as a crucial driver of innovation, job creation and societal advancement. As digital technologies reshape industries and consumer behaviour, the mindset required for entrepreneurial success has evolved accordingly, placing greater emphasis on adaptability, creativity and cognitive agility (Mitchell et al., 2002). At the forefront of this transformation is Generation Z, the cohort born roughly between 1997 and 2012, characterised by digital fluency, social consciousness and a preference for autonomy and self-expression (Turner, 2015).

Generation Z individuals have grown up in an environment marked by global connectivity, instant access to information and heightened social and environmental awareness. These contextual factors have been associated with a distinctive cognitive profile, often characterised by problem-solving capability, opportunity-seeking behaviour and comfort with ambiguity, traits traditionally associated with entrepreneurs (Gird & Bagraim, 2008). This has given rise to a popular question: are Generation Z students “born entrepreneurs” (Cane & Wah, 2021)? A single cross-sectional survey cannot establish whether entrepreneurial tendencies are innate or acquired. This study therefore asks a narrower, testable question: how are the cognitive mindset dimensions associated with entrepreneurship related to the entrepreneurial intention of Generation Z university students?

The study adopts Social Cognitive Theory (SCT) (Bandura, 1986) as its overarching theoretical lens. SCT has been applied across a range of disciplines, including organisational decision-making, employee behaviour and the adoption of technological innovations (Nwosu et al., 2022; Park et al., 2017). According to SCT, context directly shapes individuals' cognitive traits or moderates their relationship with behaviour (Saeedikiya et al., 2024). The Theory of Planned Behaviour (Ajzen, 1991) is used as a complementary model of intention formation; Section 2.3 explains how the two theories fit together.

Within this lens, the study applies the metacognitive view of the entrepreneurial mindset (Haynie et al., 2010), as presented by Hisrich et al. (2022) and operationalised in the measure of adaptive cognition (Haynie & Shepherd, 2009). The measure comprises five cognitive mindset dimensions: goal orientation, metacognitive knowledge, metacognitive experience, metacognitive choice and monitoring. The framework connects psychological theory with entrepreneurial thinking, deepening academic insight while offering guidance for entrepreneurship education, training and development.

Research gap

Entrepreneurial intention (EI) has been widely studied as a key predictor of entrepreneurial behaviour (Ajzen, 1991; Tsou et al., 2023). Nevertheless, three important gaps remain. First, most studies have focused on traditional antecedents such as the attitudes, norms and perceived control specified by the Theory of Planned Behaviour, entrepreneurial self-efficacy and entrepreneurship education, while limited attention has been given to the role of cognitive mindset in shaping entrepreneurial intention (Batista-Canino et al., 2024). Second, studies that do examine entrepreneurial cognition rarely break the cognitive mindset down into its component dimensions, so it remains unclear which specific dimensions are most closely related to intention. Third, EI research has been dominated by studies conducted in developed economies, with relatively limited evidence from developing countries, particularly the MENA region, and little research has examined the cognitive mindset of Generation Z university students despite this cohort's growing role in innovation and sustainable development (Xanthopoulou & Sahinidis, 2024).

This study addresses these gaps by examining the relationship between the five cognitive mindset dimensions and entrepreneurial intention among Generation Z undergraduate university students, most of whom were studying in Egypt. The dependent variable is general entrepreneurial intention, measured with the six-item scale of Liñán and Chen (2009). Sustainability-oriented entrepreneurship is not measured in this study and is referred to only as a direction for future research.

Research aim, question and objectives

The aim of this study is to examine the cognitive mindset of Generation Z undergraduate university students and its association with their entrepreneurial intention, in order to inform entrepreneurship education strategies. The study addresses the following research question: *To what extent are goal orientation, metacognitive knowledge, metacognitive experience, metacognitive choice and monitoring associated with the entrepreneurial intention of Generation Z undergraduate university students?*

The specific objectives are: (1) to describe the levels of the five cognitive mindset dimensions and of entrepreneurial intention among Generation Z undergraduate university students; (2) to test the relationship between each cognitive mindset dimension and entrepreneurial intention (H1–H5); (3) to identify which dimensions make a unique contribution to entrepreneurial intention when all five are considered together; and (4) to derive implications for entrepreneurship education from the findings. Table 1 (Section 3.2) operationalises the constructs, and Table 2 maps each objective to the corresponding hypothesis, variable, measure and statistical test.

The remainder of this paper is structured as follows. Section 2 reviews the literature and develops the hypotheses. Section 3 describes the methodology. Section 4 presents the results. Section 5 discusses the findings, and Sections 6 to 8 present the implications, limitations and conclusions.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Generation Z and entrepreneurship

Entrepreneurship serves as a key driver of economic progress and innovation (Cirstea & Anagnoste, 2023; Cockrell, 2022). Each generation entering adulthood has introduced distinct perspectives and approaches to business creation (Csobanka, 2016), and Generation Z is now emerging as a significant force in the entrepreneurial landscape (Cirstea & Anagnoste, 2023; Herman, 2022). As older generations leave the workforce, Generation Z, known for its deep integration with digital technologies and its distinctive value system, is entering entrepreneurship and challenging traditional business norms (Redford et al., 2023). Understanding the motivations behind this shift is essential to fostering the cohort's engagement in new venture creation (Shaaban, 2019, 2022).

Generation Z, broadly defined as the cohort born between the late 1990s and early 2010s, has been shaped by distinct formative experiences (Csobanka, 2016; Redford et al., 2023). As digital natives, its members have grown up with ubiquitous internet access and mobile technology (Cockrell, 2022; Herman, 2022). They value work-life balance, mental well-being, flexibility and work that aligns with their personal values and broader societal goals (Chillakuri, 2020; Gaidhani et al., 2019; Redford et al., 2023), and they show high awareness of global issues such as climate change and social inequality (Cockrell, 2022; Herman, 2022). These characteristics have been linked to entrepreneurial models built on digital platforms, social impact and sustainability (Cirstea & Anagnoste, 2023; Sahut et al., 2021).

Prior research has identified several drivers of entrepreneurial intention among young people. Entrepreneurship education strengthens students' intention, attitudes and entrepreneurial self-efficacy (Nabi et al., 2017; Purmono, 2023), particularly when it uses experiential, practice-based approaches (Lackéus, 2020; Neck & Greene, 2011).

Family business background, role models, peer networks and perceived economic opportunities also shape intention (Xanthopoulou & Sahinidis, 2024), while digital transformation has lowered the barriers to venture creation (Nambisan et al., 2019). These studies largely explain intention through educational and contextual factors. Fewer studies examine the internal cognitive mechanisms through which students process these influences, which is the focus of the present study. The educational and contextual factors reviewed here provide background only; they are not measured in the questionnaire.

Entrepreneurial intention

Entrepreneurial intention is commonly defined as an individual's conscious plan or commitment to establish a new venture in the future (Thompson, 2009). Rather than viewing entrepreneurship as a spontaneous event, researchers argue that the decision to create a business results from a deliberate cognitive process through which individuals evaluate opportunities, assess their capabilities and commit to entrepreneurial action (Bird, 1988). Intention is therefore considered the most proximal antecedent of entrepreneurial behaviour.

Intention and behaviour are, however, distinct constructs. Meta-analytic evidence shows that external constraints, resource availability, institutional support and environmental uncertainty influence whether intentions translate into action (Ramos-Rodríguez et al., 2019; Tsou et al., 2023). Accordingly, the hypotheses of this study concern the path from cognitive mindset to entrepreneurial intention. Entrepreneurial behaviour is not part of the research model; self-reported business ownership is used only as a background indicator in a supplementary analysis (Section 4.5).

Sustainability-oriented entrepreneurship, which pursues economic gains together with social and environmental benefits (Shepherd & Patzelt, 2011), is an increasingly important context for Generation Z's intentions (Vuorio et al., 2018). However, the instrument used in this study (Liñán & Chen, 2009) measures general entrepreneurial intention, and the questionnaire contains no sustainability items. The dependent variable is therefore labelled *entrepreneurial intention* throughout, and the measurement of sustainable entrepreneurial intention is left to future research (Section 7).

Theoretical framework: social cognition, metacognition and planned behaviour

Social Cognitive Theory explains human behaviour through the reciprocal interaction of personal cognitive factors, behaviour and the environment (Bandura, 1986). In entrepreneurship, this perspective suggests that how individuals think, including how they set goals, interpret situations and regulate their own reasoning, shapes whether they come to see entrepreneurship as a desirable and feasible career (Mitchell et al., 2002; Saeedikiya et al., 2024). Entrepreneurial cognition research builds on this view by examining the knowledge structures that people use to make judgements about opportunity evaluation and venture creation (Mitchell et al., 2002).

Metacognition, defined as awareness and regulation of one's own thinking (Flavell, 1979), provides a specific mechanism within this framework. Haynie et al. (2010) proposed that an entrepreneurial mindset is the capacity to adapt one's thinking to dynamic and uncertain contexts, and that this capacity rests on metacognitive processes. Haynie and Shepherd (2009) operationalised these processes in the measure of adaptive cognition, which Hisrich et al. (2022) present as five dimensions: goal orientation, metacognitive knowledge, metacognitive experience, metacognitive choice and monitoring. In this paper these are referred to collectively as the *cognitive mindset* and individually as the five cognitive mindset dimensions.

The Theory of Planned Behaviour (TPB) holds that intention is determined by attitude towards the behaviour, subjective norms and perceived behavioural control (Ajzen, 1991), and it remains the dominant framework in entrepreneurial intention research (Andrade & Carvalho, 2023; Loi et al., 2024). TPB is retained here as a complementary rationale rather than as part of the tested model. It suggests why cognitive capabilities should translate into intention: individuals who understand and regulate their own thinking are more likely to feel capable of managing the uncertainty of venture creation, and individuals with a clear goal orientation are more likely to view self-directed careers favourably. Attitude, subjective norms and perceived behavioural control are not measured in the questionnaire, so these mechanisms are not tested. The tested framework is the direct link *cognitive mindset* → *entrepreneurial intention*.

Following Hisrich et al. (2022), the five cognitive mindset dimensions are modelled as parallel, distinct predictors of entrepreneurial intention (Figure 1) rather than as a sequential chain or a single higher-order construct. This choice allows the study to identify which specific capabilities are most closely related to intention, which is directly relevant to the design of targeted educational interventions. Because the dimensions are conceptually related, their empirical distinctiveness is tested through discriminant validity and collinearity diagnostics (Section 4).

Hypothesis development

Goal orientation reflects the extent to which individuals define goals for themselves, relate tasks to those goals and assess their progress against them (Haynie & Shepherd, 2009; Hisrich et al., 2022). Goal setting is widely acknowledged as a key mechanism for enhancing self-regulation and sustaining long-term performance (Locke & Latham, 2002). Students who habitually set goals and track their attainment are therefore more likely to view venture creation as an attainable, self-directed objective.

H1: Goal orientation is positively associated with entrepreneurial intention among Generation Z university students.

Metacognitive knowledge encompasses an individual's awareness of their own cognitive processes: what they know about tasks, about themselves and other people, and about the strategies that have worked for them in the past (Flavell, 1979; Haynie & Shepherd, 2009). Entrepreneurs draw on such knowledge to adapt their strategies to evolving circumstances (Haynie et al., 2010). Students with greater metacognitive knowledge are expected to feel more capable of managing the uncertainty of entrepreneurship and therefore to report stronger entrepreneurial intention.

H2: Metacognitive knowledge is positively associated with entrepreneurial intention among Generation Z university students.

Metacognitive experience refers to the experiences, judgements and intuitions that individuals draw on when approaching a task, such as knowing which information matters most, organising time and information, and sensing when a strategy will be effective (Flavell, 1979; Haynie & Shepherd, 2009). Haynie et al. (2010) argued that such processes support adaptive decision-making in uncertain environments. Students who draw on these experiences may be more confident in their ability to handle entrepreneurial challenges.

H3: Metacognitive experience is positively associated with entrepreneurial intention among Generation Z university students.

Metacognitive choice concerns the extent to which individuals deliberately consider the options available to them, select the response best suited to the situation and re-evaluate their assumptions when necessary (Haynie & Shepherd, 2009; Hisrich et al., 2022). Individuals who consciously weigh alternatives are better equipped to navigate ambiguity (Haynie et al., 2010). This capacity is expected to increase students' confidence in pursuing an entrepreneurial career.

H4: Metacognitive choice is positively associated with entrepreneurial intention among Generation Z university students.

Monitoring involves seeking and using feedback to evaluate and regulate one's own thinking during a task: reviewing information, checking comprehension and analysing the usefulness of the strategies being used (Haynie & Shepherd, 2009; Hisrich et al., 2022). Monitoring supports adaptability and enables individuals to change course when initial approaches prove ineffective (Haynie et al., 2010). Students who monitor and adjust their thinking are likely to perceive entrepreneurial uncertainty as manageable.

H5: Monitoring is positively associated with entrepreneurial intention among Generation Z university students.

Research model

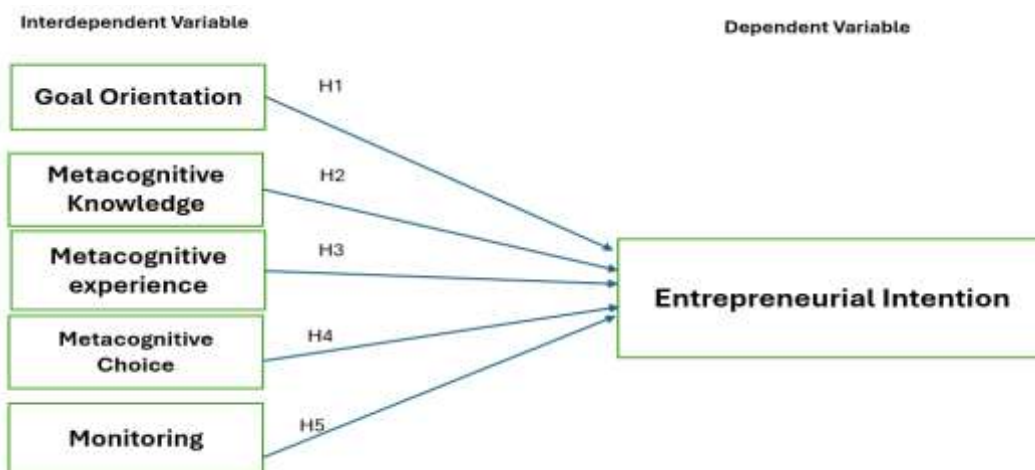


Figure 1. Research model

METHODOLOGY

Research design

This study adopted a quantitative, cross-sectional survey design to examine the relationship between the cognitive mindset of Generation Z university students and their entrepreneurial intention. A survey design is appropriate for testing hypothesised relationships between clearly defined constructs measured with multi-item scales. Because the data were collected at a single point in time, the design supports conclusions about association, not causation.

Instrument and measures

Data were collected using a structured, self-administered questionnaire with three sections (Appendix 1). Section A recorded background information: gender, age group, country of study, whether the respondent owns a start-up or business, and whether technology is used in that business. Section B measured the five cognitive mindset dimensions with 35 items: goal orientation (5 items; items 1–5), metacognitive knowledge (11 items; items 6–16), metacognitive experience (8 items; items 17–24), metacognitive choice (5 items; items 25–29) and monitoring (6 items; items 30–35). These items were taken from the measure of adaptive cognition developed by Haynie and Shepherd (2009), as reproduced in Hisrich et al. (2022). The original measure has seven monitoring items; in the questionnaire the last two were presented together as a single item (item 35), giving six monitoring items and 35 items in total. Section C measured entrepreneurial intention with the six-item scale of Liñán and Chen (2009) (items 36–41). All 41 items in Sections B and C were answered on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). This response format differs from those of the original instruments (Liñán and Chen, 2009, for example, used a seven-point scale), which is noted as a limitation in Section 7. Scale scores were computed as the mean of the items in each scale.

Table 1 presents the operationalisation of the six constructs. Table 2 shows how the research objectives, hypotheses, variables, measures and statistical tests are aligned.

Table 1. Operationalisation of the study constructs

Construct (code) and role	Operational definition	Items (numbers)	Sample item	Source
Goal orientation (GO); independent variable	Extent to which the respondent defines goals, relates tasks to those goals and assesses progress against them	5 (items 1–5)	“I often define goals for myself”	Haynie & Shepherd (2009), as reproduced in Hisrich et al. (2022)
Metacognitive knowledge (MK); independent variable	Extent to which the respondent draws on what they know about tasks, themselves, other people and previously successful strategies	11 (items 6–16)	“I think of several ways to solve a problem and choose the best one”	Haynie & Shepherd (2009), as reproduced in Hisrich et al. (2022)
Metacognitive experience (ME); independent variable	Extent to which the respondent draws on experience, judgement and intuition when approaching a task	8 (items 17–24)	“I depend on my intuition to help me formulate strategies”	Haynie & Shepherd (2009), as reproduced in Hisrich et al. (2022)
Metacognitive choice (MC); independent variable	Extent to which the respondent deliberately considers the available options and re-evaluates assumptions	5 (items 25–29)	“I re-evaluate my assumptions when I get confused”	Haynie & Shepherd (2009), as reproduced in Hisrich et al. (2022)
Monitoring (MON); independent variable	Extent to which the respondent checks comprehension and evaluates the usefulness of strategies during a task	6 (items 30–35)	“I stop and go back over information that is not clear”	Haynie & Shepherd (2009), as reproduced in Hisrich et al. (2022)
Entrepreneurial intention (EI); dependent variable	Respondent's self-acknowledged determination to start and run their own firm in the future	6 (items 36–41)	“I am determined to create a firm in the future”	Liñán & Chen (2009)

Note. All items were answered on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). Scale scores are item means. Item wording is given in Appendix 1.

Table 2. Alignment of objectives, hypotheses, variables, measures and tests

Objective	Hypothesis	Independent variable (items)	Dependent variable (items)	Statistical test
1, 2, 3	H1	Goal orientation (5)	Entrepreneurial intention (6; Liñán & Chen, 2009)	Pearson correlation; multiple linear regression
1, 2, 3	H2	Metacognitive knowledge (11)	Entrepreneurial intention (6)	Pearson correlation; multiple linear regression
1, 2, 3	H3	Metacognitive experience (8)	Entrepreneurial intention (6)	Pearson correlation; multiple linear regression
1, 2, 3	H4	Metacognitive choice (5)	Entrepreneurial intention (6)	Pearson correlation; multiple linear regression
1, 2, 3	H5	Monitoring (6)	Entrepreneurial intention (6)	Pearson correlation; multiple linear regression
4	–	All findings	–	Interpretation (Sections 5–6)

Note. Cognitive mindset items from Haynie and Shepherd (2009), as reproduced in Hisrich et al. (2022). Measurement quality was assessed through Cronbach's alpha, one-factor models for each construct (loadings, CR, AVE) and HTMT.

Sampling and participants

Participants were undergraduate university students belonging to the Generation Z cohort (born 1997–2012). A non-probability purposive sampling strategy was used: the survey link was circulated to Generation Z undergraduates at universities in different countries, and participation was self-selected. Cohort membership was checked through the age-group item. The final sample comprised 79 respondents from ten countries. Most were studying in Egypt ($n = 67$; 84.8%), and the remaining 12 (15.2%) were spread across Italy, the United States, Malaysia, Turkey, Saudi Arabia, Nigeria, Panama, Belgium and Greece. Because the non-Egyptian sub-samples are very small and were not drawn randomly, the study does not compare countries, and the findings cannot be generalised to the national student populations of the participating countries or to young people outside higher education (see Section 7). Table 3 presents the sample profile.

Data collection

Data were collected through an online survey platform (Microsoft Forms) during the academic year 2024/2025, which allowed undergraduate students at universities in different countries to take part. Participation was voluntary and anonymous, and background information was limited to gender, age group, country of study, business ownership and technology use in the business. Respondents were informed that there were no right or wrong answers, which helps to reduce social desirability and common-method bias (Podsakoff et al., 2003).

Data analysis

Duplicate records were removed before analysis, leaving 79 unique responses. The data were then analysed in three stages. First, the measurement properties of the six scales were assessed using Cronbach's alpha, standardised item loadings, composite reliability (CR) and average variance extracted (AVE), with discriminant validity examined using the heterotrait–monotrait ratio (HTMT) and the Fornell–Larcker criterion (Fornell &

Larcker, 1981; Henseler et al., 2015). Second, descriptive statistics and Pearson correlations were computed, and H1 to H5 were tested using multiple linear regression with entrepreneurial intention (mean of items 36–41) as the dependent variable and the five cognitive mindset dimensions entered simultaneously as predictors. Multicollinearity was assessed using variance inflation factors (VIF). Third, as supplementary analyses outside the hypotheses, binary logistic regression was used to examine whether the five dimensions were related to business ownership (1 = owns a start-up or business, 0 = does not), and independent-samples t-tests were used to compare the dimensions by gender.

RESULTS

Sample profile

Table 3. Demographic profile of respondents (N = 79)

Characteristic	Category	n	%
Gender	Female	50	63.3
	Male	29	36.7
Age group	18–20	13	16.5
	21–23	58	73.4
	Over 23	8	10.1
Country	Egypt	67	84.8
	Other (Italy, USA, Malaysia 2 each; Panama, Belgium, Nigeria, Saudi Arabia, Greece, Turkey 1 each)	12	15.2
Owns a start-up / business	Yes	19	24.1
	No	60	75.9
Uses technology in the business	Yes	25	31.6
	No	49	62.0
	No answer	5	6.3

Table 3 shows that 63.3% of respondents were female and 36.7% male, and that most (73.4%) were aged 21–23. Respondents came from ten countries: most (84.8%) were based in Egypt, and the remaining 15.2% were studying in Italy, the United States, Malaysia, Turkey, Saudi Arabia, Nigeria, Panama, Belgium and Greece. In addition, 24.1% reported that they already own a start-up or business.

Measurement model

Table 4 reports the reliability and convergent validity of the constructs. For the five cognitive mindset constructs, Cronbach's alpha values ranged from .756 to .850, and composite reliability ranged from .765 to .851, all exceeding the .70 threshold (Hair et al., 2016). However, AVE values ranged from .243 to .448, below the recommended .50 (Fornell & Larcker, 1981), and six items had standardised loadings below .50. Convergent validity is therefore only partially supported, and the results should be interpreted with caution.

Table 4. Reliability and convergent validity (N = 400)

Construct	Items	Loading range	Cronbach's α	CR	AVE
Goal orientation (GO)	5	.562–.795	.794	.798	.445
Metacognitive knowledge (MK)	11	.273–.653	.756	.765	.243
Metacognitive experience (ME)	8	.570–.773	.850	.851	.419
Metacognitive choice (MC)	5	.495–.709	.770	.768	.401
Monitoring (MON)	6	.518–.790	.823	.827	.448
Entrepreneurial intention (EI)	6	.487–.729	.870	.878	.436

Note. Standardised loadings from a one-factor maximum-likelihood model for each construct (items z-standardised; listwise n = 76–79). CR = composite reliability; AVE = average variance extracted. Items with loadings below .50: MK items 7, 8, 9, 13 and 16, and MC item 29 (questionnaire numbering).

Descriptive statistics and correlations

Table 5. Descriptive statistics and correlations among study variables (N = 400)

	Mean	SD	GO	MK	ME	MC	MON
GO	3.88	0.76	1				
MK	3.91	0.64	.674**	1			
ME	3.76	0.76	.778**	.695**	1		
MC	3.73	0.85	.687**	.731**	.744**	1	
MON	3.78	0.76	.641**	.656**	.673**	.786**	1
EI	3.74	0.86	.743**	.755**	.882**	.875**	1
Business ownership (1 = yes; supplementary)	0.24	0.43	.050	–.072	.027	–.131	–.071

Note. ** $p < .01$ (two-tailed). Means are item averages on a 1–5 scale. GO = goal orientation; MK = metacognitive knowledge; ME = metacognitive experience; MC = metacognitive choice; MON = monitoring; EI = entrepreneurial intention.

As Table 5 shows, the five cognitive mindset dimensions were strongly and positively intercorrelated ($r = .641$ to $.786$, $p < .01$). The highest correlations were between metacognitive choice and monitoring ($r = .786$) and between goal orientation and metacognitive experience ($r = .778$), the results shows that the mean (3.74) and standard deviation is (0.86) of entrepreneurial intention

Supplementary analysis: business ownership

Because the hypotheses concern intention rather than behaviour, business ownership is not part of the research model. As a supplementary check, binary logistic regression was used to examine whether the five cognitive

mindset dimensions were related to whether respondents already own a start-up or business (Section A of the questionnaire). Table 8 reports the results.

Table 6. Supplementary binary logistic regression predicting business ownership (N = 79)

Predictor	Path	B	SE	Wald	p	OR	95% CI for OR	VIF	Result
GO	GO → Own	0.683	0.645	1.121	.290	1.980	0.559–7.013	2.875	Not significant
MK	MK → Own	– 0.401	0.726	0.305	.580	0.670	0.161–2.777	2.554	Not significant
ME	ME → Own	0.666	0.690	0.931	.335	1.946	0.503–7.529	3.350	Not significant
MC	MC → Own	– 1.075	0.661	2.642	.104	0.341	0.093–1.248	3.754	Not significant
MON	MON → Own	0.088	0.603	0.021	.884	1.092	0.335–3.558	2.819	Not significant
Model	$\chi^2(5) = 5.53$, $p = .355$; $-2LL = 81.63$; Nagelkerke $R^2 = .101$; Cox & Snell $R^2 = .068$; correctly classified = 77.2% (baseline 75.9%)								

The overall model was not statistically significant ($\chi^2(5) = 5.53$, $p = .355$; Nagelkerke $R^2 = .101$) and correctly classified 77.2% of cases, only slightly above the 75.9% that would be achieved by predicting “no” for every respondent. None of the five cognitive mindset dimensions was significantly related to business ownership, either in the regression (all $p > .10$) or in the bivariate correlations ($r = -.131$ to $.050$, all $p > .25$; Table 6). These results do not bear on H1 to H5, which concern entrepreneurial intention. VIF values ranged from 2.55 to 3.75, below the threshold of 5, although the high HTMT values show substantial overlap among the dimensions. Independent-samples t-tests showed no significant gender differences on any dimension (all $p > .28$).

DISCUSSION

This study examined how five cognitive mindset dimensions relate to the entrepreneurial intention of Generation Z undergraduate university students, most of them studying in Egypt.

The measurement results are informative in their own right. The five cognitive mindset scales were internally consistent, but they were strongly intercorrelated, average variance extracted was below .50 for every scale, and five of the ten HTMT ratios exceeded .90; metacognitive choice and monitoring were almost indistinguishable (HTMT = .996). The five dimensions, while conceptually distinct in the framework of Haynie and Shepherd (2009) and Hisrich et al. (2022), therefore overlap considerably in practice among this student sample. Any unique effects of individual dimensions on entrepreneurial intention should be interpreted with this overlap in mind, and future studies should test whether the dimensions are better represented as a single higher-order construct.

The supplementary analysis showed that none of the five dimensions was related to whether students already own a start-up or business. This is consistent with evidence that cognitions and intentions do not automatically translate into entrepreneurial behaviour (Tsou et al., 2023). The result should be read cautiously, however: business ownership was captured with a single yes/no item, only 19 respondents reported owning a business, and the analysis therefore had limited statistical power.

The findings should not be read as evidence for or against the claim that Generation Z students are innately or “naturally” entrepreneurial. A cross-sectional survey of cognitive mindset and entrepreneurial intention cannot establish whether these characteristics are inborn, developed through education and experience, or shaped by the

digital environment in which this cohort has grown up. Social Cognitive Theory suggests that such capabilities develop through interaction with the environment (Bandura, 1986), which implies that they can be strengthened through education.

Finally, the results add to the limited evidence on entrepreneurial cognition in the MENA region. Most respondents were studying in Egypt, so the study extends research on the cognitive mindset and entrepreneurial intention beyond the developed-economy contexts in which most entrepreneurial intention research has been conducted (Batista-Canino et al., 2024; Xanthopoulou & Sahinidis, 2024). The small number of respondents from the other nine countries does not support cross-country conclusions.

Practical and educational implications

The implications below are tentative and depend on the hypothesis-test results. GO = goal orientation; MK = metacognitive knowledge; ME = metacognitive experience; MC = metacognitive choice; MON = monitoring; EI = entrepreneurial intention were significances and correlated. If cognitive mindset dimensions are associated with entrepreneurial intention, entrepreneurship education could develop them alongside traditional content, for example through structured goal-setting exercises, reflective learning journals that build students' awareness of their own thinking, and iterative projects in which students track progress and adjust their strategies. Prior research suggests that experiential approaches such as business simulations, incubator programmes and real-world projects are well suited to this purpose (Lack  us, 2020; Nabi et al., 2017).

Because the five dimensions overlapped strongly in this sample, educators may find it more useful to treat the cognitive mindset as one integrated capability than to design separate interventions for each dimension.

Entrepreneurship education and support ecosystems were not measured in this study, so the following suggestion rests on prior literature rather than on the present data. Governments and universities can invest in partnerships between universities, industry and incubators (Nabi et al., 2017). Because intention does not automatically lead to action, such ecosystems may help students turn their intentions into ventures by providing access to finance, mentoring and networks.

Limitations and future research

Several limitations should be considered when interpreting the findings. First, the cross-sectional design captures relationships at a single point in time and does not allow causal inference. Second, the sample is small ($N = 79$), was drawn purposively through self-selection and is dominated by students in Egypt (84.8%), while each of the other nine countries is represented by one or two respondents. Cross-country comparisons were therefore not possible, statistical power is limited, and the findings cannot be generalised to the student populations of the participating countries or to young people outside higher education. Third, all data were self-reported and collected with a single instrument, so the results may be affected by social desirability and common-method bias. Fourth, background information was limited to gender, age group, country of study, business ownership and technology use; the study therefore could not control for factors known to influence entrepreneurial intention, such as family business background, entrepreneurship education exposure and incubator participation. Fifth, the hypotheses concern intention rather than behaviour; business ownership was captured with a single yes/no item reported by only 19 respondents, and there is no longitudinal evidence on whether intentions lead to venture creation. Sixth, convergent and discriminant validity were weak: AVE was below .50 for all five cognitive mindset scales, six items loaded below .50 and five HTMT ratios exceeded .90, so the five dimensions cannot be treated as empirically distinct in this sample. Seventh, the instruments were administered with adaptations that were not separately validated: a five-point agreement format replaced the original response formats, and the final two monitoring items of Haynie and Shepherd (2009) were combined into one double-barrelled item (item 35). Finally, the dependent variable is general entrepreneurial intention, not sustainable entrepreneurial intention.

These limitations point to several directions for future research. Longitudinal studies could track how cognitive mindset and intention develop during university and whether they lead to actual venture creation. Future studies should use probability samples drawn from public and private universities, multiple disciplines and balanced

samples from several countries that allow cross-country comparison, and should include demographic and background controls. A validated sustainable entrepreneurial intention scale should be added so that the sustainability component can be tested directly (Usman et al., 2024; Vuorio et al., 2018). Researchers could also refine the cognitive mindset scales and test whether the five dimensions form a higher-order construct. Qualitative or mixed-methods designs, such as focus groups with Generation Z students, would help explain how students experience and develop these cognitive capabilities. Finally, intervention studies could examine whether specific pedagogical approaches strengthen the cognitive mindset and, through them, entrepreneurial intention.

CONCLUSION

This study examined whether the cognitive mindset of Generation Z undergraduate university students is associated with their entrepreneurial intention. Among 79 undergraduate students at universities in ten countries, most of them in Egypt, the five cognitive mindset scales were reliable but overlapped strongly, and none was related to current business ownership. Subject to the study's methodological limitations, the findings do not show that Generation Z is inherently entrepreneurial. Rather, they indicate that the cognitive mindset is better understood as a set of closely related, learnable capabilities whose link to entrepreneurial intention and action needs to be tested with larger samples.

REFERENCES

1. Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior 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)
2. Andrade, F. L., & Carvalho, L. M. C. (2023). Entrepreneurial intention of university students under the perspective of the theory of planned behaviour: Integrative literature review. *Administrative Sciences*, 13(11), 242.
3. Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Prentice-Hall.
4. Batista-Canino, R. M., Santana-Hernández, L., & Medina-Brito, P. (2024). A holistic literature review on entrepreneurial intention: A scientometric approach. *Journal of Business Research*, 174, 114480. <https://doi.org/10.1016/j.jbusres.2023.114480>
5. Bird, B. (1988). Implementing entrepreneurial ideas: The case for intention. *Academy of Management Review*, 13(3), 442–453.
6. Cane, O., & Wah, S. (2021). Are we born entrepreneur or do we become entrepreneur? *Journal of Marketing Management*, 10, 2371–3615.
7. Chillakuri, B. (2020). Examining the role of supervisor support on Generation Z's intention to quit. *American Business Review*, 23(2), 408–430. <https://doi.org/10.37625/abr.23.2.408-430>
8. Cirstea, P., & Anagnoste, S. (2023). Young, wild & entrepreneurial: Generation Z's affinity for entrepreneurship. *Proceedings of the International Conference on Business Excellence*, 17, 930–947.
9. Cockrell, K. N. (2022). An IMC approach to entrepreneurship: How Generation Z is changing the landscape of entrepreneurship [Honors thesis, University of Mississippi]. eGrove. https://egrove.olemiss.edu/cgi/viewcontent.cgi?article=3591&context=hon_thesis
10. Csobanka, Z. E. (2016). The Z generation. *Acta Educationis Generalis*, 6(2), 63–76.
11. Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive–developmental inquiry. *American Psychologist*, 34(10), 906–911.
12. Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50.
13. Gaidhani, S., Arora, L., & Sharma, B. (2019). Understanding the attitude of Generation Z towards workplace. *International Journal of Management, Technology and Social Sciences*, 4(2), 151–162.
14. Gird, A., & Bagraim, J. J. (2008). The theory of planned behaviour as predictor of entrepreneurial intent amongst final-year university students. *South African Journal of Psychology*, 38(4), 711–724.
15. Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2016). *Multivariate data analysis* (12ed.). Pearson.

16. Haynie, J. M., & Shepherd, D. A. (2009). A measure of adaptive cognition for entrepreneurship research. *Entrepreneurship Theory and Practice*, 33(3), 695–714. <https://doi.org/10.1111/j.1540-6520.2009.00322.x>
17. Haynie, J. M., Shepherd, D., Mosakowski, E., & Earley, P. C. (2010). A situated metacognitive model of the entrepreneurial mindset. *Journal of Business Venturing*, 25(2), 217–229. <https://doi.org/10.1016/j.jbusvent.2008.10.001>
18. Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), 115–135. <https://doi.org/10.1007/s11747-014-0403-8>
19. Herman, E. (2022). Digital entrepreneurship as a driver of sustainable development and economic growth in the post-COVID-19 era. *Sustainability*, 14(17), 10903.
20. Hisrich, R. D., Peters, M. P., & Shepherd, D. A. (2022). *Entrepreneurship* (12th ed.). McGraw Hill.
21. Lackéus, M. (2020). Comparing the impact of three different experiential approaches to entrepreneurship in education. *International Journal of Entrepreneurial Behavior & Research*, 26(5), 937–971. <https://doi.org/10.1108/IJEBR-04-2018-0236>
22. 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>
23. Locke, E. A., & Latham, G. P. (2002). Building a practically useful theory of goal setting and task motivation: A 35-year odyssey. *American Psychologist*, 57(9), 705–717. <https://doi.org/10.1037/0003-066X.57.9.705>
24. Loi, M., Castriotta, M., Barbosa, S. D., Di Guardo, M. C., & Fayolle, A. (2024). Entrepreneurial intention studies: A hybrid bibliometric method to identify new directions for theory and research. *European Management Review*, 21(3), 581–604.
25. Mitchell, R. K., Busenitz, L., Lant, T., McDougall, P. P., Morse, E. A., & Smith, J. B. (2002). Toward a theory of entrepreneurial cognition: Rethinking the people side of entrepreneurship research. *Entrepreneurship Theory and Practice*, 27(2), 93–104.
26. Nabi, G., Liñán, F., Fayolle, A., Krueger, N., & Walmsley, A. (2017). The impact of entrepreneurship education in higher education: A systematic review and research agenda. *Academy of Management Learning & Education*, 16(2), 277–299.
27. Nambisan, S., Wright, M., & Feldman, M. (2019). The digital transformation of innovation and entrepreneurship: Progress, challenges and key themes. *Research Policy*, 48(8), 103773.
28. 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>
29. Nwosu, H. E., Obidike, P. C., Ugwu, J. N., Udeze, C. C., & Okolie, U. C. (2022). Applying social cognitive theory to placement learning in business firms and students' entrepreneurial intentions. *The International Journal of Management Education*, 20(1), 100602. <https://DOI:10.1016/j.ijme.2022.100602>.
30. Park, J. Y., Sung, C. S., & Im, I. (2017). Does social media use influence entrepreneurial opportunity? A review of its moderating role. *Sustainability*, 9(9), 1593.
31. 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), 879–903. <https://doi.org/10.1037/0021-9010.88.5.879>
32. Purmono, B. B. (2023). Entrepreneurial intention among Generation Z: Education, self-efficacy and attitude. *Enrichment: Journal of Management*, 13(1), 16–31. <https://doi.org/10.35335/enrichment.v13i1.1228>
33. Ramos-Rodríguez, A. R., Medina-Garrido, J. A., & Ruiz-Navarro, J. (2019). Why not now? Intended timing in entrepreneurial intentions. *International Entrepreneurship and Management Journal*, 15, 1221–1246. <https://doi.org/10.1007/s11365-019-00586-5>
34. Redford, D., Cagarman, K., von Arnim, L., Bürger, T., & Weber, J. (2023). Pioneering Gen Z entrepreneurs: Reflections and policy considerations. Bertelsmann Stiftung. <https://doi.org/10.11586/2023090>

35. Saeedikiya, M., Salamzadeh, A., Salamzadeh, Y., & Aeeni, Z. (2024). Cognitions affecting innovation among Generation Z entrepreneurs: The external enablement of digital infrastructure. *International Journal of Entrepreneurial Behavior & Research*, Volume 30, Issue 2/3. 572–608. <http://doi.0.1108/IJEBR-02-2023-0188>
36. Sahut, J. M., Iandoli, L., & Teulon, F. (2021). The age of digital entrepreneurship. *Small Business Economics*, 56(3), 1159–1169.
37. Shaaban, S. (2019). Reviewing Egyptian community social fund (village savings and loans association, VSLA) as an approach for community social fund. *Horticulture International Journal*, 3. <http://doi.10.15406/hij.2019.03.00105>
38. Shaaban, S. (2022). Can village savings and loans association (VSLA) approach achieve/promote rural sustainable development in the Egyptian community? *Journal of Chinese Economic and Foreign Trade Studies*, 15(3), 332–349.
39. Shepherd, D. A., & Patzelt, H. (2011). The new field of sustainable entrepreneurship: Studying entrepreneurial action linking "what is to be sustained" with "what is to be developed". *Entrepreneurship Theory and Practice*, 35(1), 137–163.
40. Thompson, E. R. (2009). Individual entrepreneurial intent: Construct clarification and development of an internationally reliable metric. *Entrepreneurship Theory and Practice*, 33(3), 669–694.
41. Tsou, E., Steel, P., & Osiyevskyy, O. (2023). The relationship between entrepreneurial intention and behavior: A meta-analytic review. *International Small Business Journal*, 1-11. <http://doi.10.1177/14657503231214389>
42. Turner, A. (2015). Generation Z: Technology and social interest. *The Journal of Individual Psychology*, 71(2), 103–113.
43. Usman, M., Usman, M., Wasim, M., & Habib, A. (2024). Determinants for sustainable entrepreneurial intentions: A systematic literature review. *iRASD Journal of Economics*, 6(2), 494–512. <https://doi.org/10.52131/joe.2024.0602.0220>
44. Vuorio, A. M., Puumalainen, K., & Fellnhofer, K. (2018). Drivers of entrepreneurial intentions in sustainable entrepreneurship. *International Journal of Entrepreneurial Behavior & Research*, 24(2), 359–381. <https://doi.org/10.1108/IJEBR-03-2016-0097>
45. Xanthopoulou, P., & Sahinidis, A. (2024). Students' entrepreneurial intention and its influencing factors: A systematic literature review. *Administrative Sciences*, 14(5), 98.

APPENDIX 1. QUESTIONNAIRE

Section A. Background information. Gender; age group (18–20, 21–23, over 23); country of study; “Do you own a start-up or business?” (yes/no); “Do you use technology in the business?” (yes/no).

Sections B and C. Cognitive mindset (items 1–35; Haynie & Shepherd, 2009, as reproduced in Hisrich et al., 2022) and entrepreneurial intention (items 36–41; Liñán & Chen, 2009). Response scale for all items: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree.

no	
1	I often define goals for myself
2	I understand how accomplishment of a task relates to my goals
3	I set specific goals before I begin a task
4	I ask myself how well I’ve accomplished my goals once I’ve finished
5	When performing a task, I frequently assess my progress against my objectives
6	I think of several ways to solve a problem and choose the best one



7	I challenge my own assumptions about a task before I begin
8	I think about how others may react to my actions
9	I find myself automatically employing strategies that have worked in the past
10	I perform best when I already have knowledge of the task
11	I create my own examples to make information more meaningful
12	I try to use strategies that have worked in the past
13	I ask myself questions about the task before I begin
14	I try to translate new information into my own words
15	I try to break problems down into smaller components
16	I focus on the meaning and significance of new information
17	I think about what I really need to accomplish before I begin a task
18	I use different strategies depending on the situation
19	I organize my time to best accomplish my goals
20	I am good at organizing information
21	I know what kind of information is most important to consider when faced with a problem
22	I consciously focus my attention on important information
23	My “gut” tells me when a given strategy I use will be most effective
24	I depend on my intuition to help me formulate strategies
25	I ask myself if I have considered all the options when solving a problem
26	I ask myself if there was an easier way to do things after I finished a task
27	I ask myself if I have considered all the options after I solve a problem
28	I re-evaluate my assumptions when I get confused
29	I ask myself if I have learned as much as I could have after I finish the task
30	I periodically review to help me understand important relationships
31	I stop and go back over information that is not clear
32	I am aware of what strategies I use when engaged in a given task
33	I find myself analyzing the usefulness of a given strategy while engaged in a given task
34	I find myself pausing regularly to check my comprehension of the problem or situation at hand



35	I ask myself questions about how well I am doing while I am performing a novel task. I stop and re-read when I get confused
36	I am ready to do anything to be an entrepreneur
37	My professional goal is to become an entrepreneur.
38	I will make every effort to start and run my own business.
39	I am determined to create a business in the future.
40	I have seriously thought about starting a business.
41	I intend to start a business someday