

Article

Developing Female Sustainable Entrepreneurial Intentions through an Entrepreneurial Mindset and Motives

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Abstract: In this study, we investigated the effect of entrepreneurial competencies (ECs) on entrepreneurial mindset (EM), entrepreneurial intention (EI), and entrepreneurial motives (EMTs) among female Saudi Arabian university students. We applied a quantitative approach and collected the data through a survey questionnaire by using convenience sampling to trace the respondents. Finally, the results of this study were based on 388 samples. By using a structural equation model (SEM), the findings demonstrate that ECs have positive and significant effects on EM, EI, and EMTs. In addition, there are positive and significant relationships between EM and EI as well as between EMTs and EI. Finally, EM and EMTs mediate the connection between ECs and EI. The findings of this study could support policymakers at different levels in developing their financial models, plans, and suggestions for entrepreneurial development. In addition, the findings should inspire well motivated people to engage in entrepreneurial activities and to aspire to become entrepreneurs. Finally, the originality and value of this research contribute to the existing literature, by demonstrating among Saudi Arabian female university students, the effects of ECs on EM, EI, and EMTs.

Keywords: entrepreneurial competencies (ECs); entrepreneurial mindset (EM); entrepreneurial motives (EMTs); entrepreneurial intention (EI); Saudi Arabian female university students; entrepreneurship



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1. Introduction

Currently, entrepreneurship is well known for creating opportunities in economic development and changing global businesses and markets [1]. Entrepreneurship is important for the development of new ideas; however, it can also present risks [2,3]. Women's entrepreneurial skills have been shown to provide innovation and wealth development that can enable economic growth [4–6]. The empowerment of women is possible through entrepreneurship.

In Saudi Arabia, the government has devoted significant resources to foster an entrepreneurial culture, and entrepreneurship is a developing field. For instance, the Saudi Arabian government has created public and private institutions that provide services and support business owners when they start up their businesses [7,8]. These activities were also reflected in the 2019 GEM report which indicated that 76.3% of Saudi Arabia's adult population believed that the government offered appealing possibilities for launching a business [9]; moreover, according to the 2019 GEM report, roughly 33% of Saudi Arabia's population indicated their intentions to start businesses within the next three years. In addition, Saudi Arabia's total entrepreneurial activity (TEA) rate is relatively comparable to the GEM average. The 2019 GEM report expressed optimism about Saudi Arabia's business environment. Moreover, higher education institutes have made a very constructive contribution to nurturing entrepreneurship among women who are willing to start their own businesses and to become self-employed [2,5]. Therefore, there is a need to investigate EI among Saudi Arabia's female university students. EI refers to a person's conscious awareness and belief that they want to launch their own business in the future [8,10]. By

taking into consideration the significance and potential of this group of students, in this study, we examined these students' ECs on their EM, EI, and EMTs. Therefore, we aimed to answer the following research questions:

Q1: What are the effects of ECs on EM, EI, and EMTs among Saudi Arabia's female university students?

Q2: How do EM and EMTs mediate the association between ECs and EI among Saudi Arabia's female university students?

The findings of this study should assist policymakers to design policies that encourage female university students to fulfil their entrepreneurial activities and tasks. The findings should also provide university authorities with guidance to develop effective entrepreneurial education and technological advancement to divert female university students' intentions toward entrepreneurship and, thereby, eliminate unemployment. This paper is organized as follows: The introduction is provided in Section 1; Section 2 comprises the literature review and formulation of the hypotheses; Section 3 explains the study methods; Section 4 provides the data analysis; Section 5 presents the discussion and conclusions; and finally, Section 7 explains the limitations and implications of this study and makes recommendations for future research studies.

2. Literature Review and Formulation of the Hypotheses

2.1. Entrepreneurial Competencies (ECs)

ECs are crucial for business development and expansion. Government organizations and others frequently employ the idea of ECs to pursue economic growth and corporate success [11]. The value of ECs lies in their ability to predict the activity of an entrepreneur [12]. According to [13], factors such as ECs, competitive scope, and organizational capabilities can predict business performance. Entrepreneurship education programs help to develop ECs and the EI needed to start a business [14]. The authors of [15] suggested that ECs among female entrepreneurs, compared to their male counterparts, were more valuable for predicting small firm performance. The entrepreneurs' abilities to seize opportunities and their relational, innovative, human, and strategic qualities have direct and indirect impacts on SMEs' long-term performances [16]. Through entrepreneurial experiences, students can develop ECs [17]. In a developing context, the needs, opportunities, and start-up motivations of women entrepreneurs have direct, significant, and meaningful effects on small firm performance through the mediation of their ECs and motivation to learn [18]. The findings of [19] showed that ECs positively and significantly contributed to developing organizational capabilities, which, in turn, led to small firm performance. Organizational capabilities have a favorable influence on small firm performance and, to some extent, mediate the connection between ECs and small firm performance. In Australia and Malaysia, ECs are strong predictors of successful SMEs. Additionally, in Malaysia but not in Australia, ECs benefit from cultural orientations (both collectivism and tolerance for ambiguity) [20]. ECs are known as the characteristics of successful entrepreneurship. They are linked to the knowledge, attitude, and abilities that an entrepreneur must either possess or develop to achieve great results and to maximize business profits. These entrepreneurial skills are essential criteria for businesses to be successful [21]. Similarly, ECs mediate the association between entrepreneurial orientation and small firm performance. Furthermore, environmental dynamism reinforces the beneficial association between ECs and performance [22]. The findings of [23] acknowledged that ECs played vital roles in fostering SMEs' innovation and long-term success. Additionally, innovation partially moderated the relationship between ECs and manufacturing SMEs' sustainable performance. According to a study by [24], the performance of a spin-off during the "growth" phase was positively impacted by the entrepreneurial capabilities of the original team that were strengthened during the "creation" phase. Through the development of a team's entrepreneurial capabilities, the original team's networks had secondary impacts on the success of a spin-off. The dimensions of the entrepreneurship attitude orientation (EAO) measure, except for personal control, were reported to be substantially and favorably affected by the gamified simulation

experience among students from various high schools in the region of Granada (Spain). It is highly desirable to include gamified simulation activities in high school courses to, among other beneficial impacts, lower the psychological barriers relating to self-esteem or an absence of innovation that may prevent individuals from becoming entrepreneurs [25]. The authors of [26] advocated that ECs played beneficial and significant roles in the management of a business's control system. Corporate strategy (cost leadership and differentiation strategy) has a significant influence on business performance, whereas ECs link cultural planning, cybernetics, rewards and pay, administrative control, and business performance. In [27], the authors stated that the ability to identify exploitable opportunities and the competency to recognize opportunities are two different concepts. Students who are skilled at identifying opportunities are motivated to start their own businesses. However, they may need either more skills or opportunities to make this happen. It has been reported that entrepreneurial knowledge, entrepreneurial awareness, and absorptive capacity are significant predictors of competencies in recognizing opportunities.

2.2. Entrepreneurial Mindset (EM)

In recent years, EM has become more prevalent in discussions of entrepreneurship, as researchers examine its origins, mechanisms, and manifestations [2]. Defined as the ability to perceive, act, and mobilize in ambiguous situations [28], EM is an important factor for understanding how entrepreneurs approach their work [29]. Through an entrepreneurial-directed approach to education, students gain a better understanding of entrepreneurship, which helps them to develop the behaviors and abilities necessary for academic success [30]. Teachers use design thinking methodologies to guide students' projects and to assess students' EM development [31].

EM is affected by expectations, entrepreneurial identity, as well as self-efficacy [32]. As a result, entrepreneurship education in higher education institutions has increasingly aimed to foster students' EM [33]. To effectively support students' EM, entrepreneurship education and self-efficacy must be mediated [34]. While entrepreneurial education also affects EM, attitude, and self-efficacy, it is important to note that entrepreneurial self-efficacy specifically encourages an entrepreneurial mindset.

2.3. Entrepreneurial Motives (EMTs)

Research has shown a positive correlation between narcissism and entrepreneurial goals among MBA students. Additionally, a subgroup analysis of high-EI business undergraduate and MBA students, specifically early-stage fledgling entrepreneurs, revealed a range of motivations for participation in the startup process [35]. The findings of [36] confirmed that, for 80% of informal entrepreneurs, starting a business was motivated by necessity as well as opportunity. However, as their initiatives gained traction, their motivations shifted toward opportunity drivers.

Employing a PLS-SEM analysis, ref. [37] found that entrepreneurial mindset traits (i.e., EMTs) influenced attitude toward a meal-sharing economy and the desire to participate in it. Participants' attitudes toward a sharing economy were affected by factors such as independence, social interactions, and gratification from hosting.

According to [38], while economic survival is the primary motivation for Mexican business people, Canadian and American business people value intrinsic pleasures more than perceptions of success. The research by [39] revealed entrepreneurial obstacles that are common to all emerging economies, despite situational differences. Motivations are also linked to corporate resources, behaviors, and performance [40]. In addition, there are significant variations in typical salary levels and the number of years in business.

2.4. Entrepreneurial Intention (EI)

The achievement of entrepreneurial goals is positively correlated with effective family-work enrichment through the mediating role of entrepreneurial self-efficacy. This relationship is particularly strong for individuals who prefer less work-home segmentation [41].

While prison entrepreneurship programs have been shown to have no direct impact on prisoners' EIs, they have been found to enhance prisoners' self-efficacy and entrepreneurial resilience, which in turn, promote the development of EI [42]. However, previous studies have suggested that entrepreneurial resilience does not affect the EIs of prisoners who have no prior experience with entrepreneurship training [43].

Education, gender, diversity education, and owner's minority status have significant impacts on digital innovation [43]. Attitude is a strong predictor of decision making among Italian university students [44], and there are differences between men and women in their perceptions of cognitive, economic, and social recognition [45]. Perceived self-efficacy and perceived desirability are significant factors that enable EI among business students in Pakistani universities, and entrepreneurial knowledge moderates these associations [46]. Using the theory of planned behavior (TPB), ref. [47] suggested the positive and significant effect of factors such as personnel attitude, EMTs, subjective norms, and perceived behavioral control on EI among female students. Likewise, with the help of the TBP, a longitudinal study by [48] confirmed a positive and significant correlation between attitude toward entrepreneurship and EI. By employing the entrepreneurial event model (EEM), scholars such as [49,50] claimed a predictive and positive effect of self-efficacy, perceived desirability, and perceived feasibility on EI among the students of Pakistan.

While self-efficacy can play an influential role in resolving conflicts, there is a positive correlation between perceived impediments and entrepreneurial exit intentions [51]. During the COVID-19 pandemic, the desire to start a business has been essential in mediating job uncertainty and green EI, with entrepreneurial passion as a mediator [52]. Demographic, social, and environmental factors significantly influence the EI of engineering undergraduates, while age and occupation do not indicate a person's intentions to work for themselves [53]. The antecedents of future entrepreneurs, such as role models and innovation, significantly influence digital entrepreneurial decisions, and digital competence increases the propensity to launch digital businesses [54,55].

Personality traits, such as conscientiousness, have a positive impact on EI, while neuroticism has a negative effect [55]. Entrepreneurial education has been found to modulate the impacts of demand for achievement, locus of control, and innovation on EI to some extent [56]. The factors that affect EI vary between genders; male students and students whose parents either own businesses or have retired have higher EI, while female students are affected by subjective norms, attitude, and perceived behavioral control [33,57]. Social pressures have been reported to affect the intention of female Italian business students to become entrepreneurs [58].

Several studies have investigated EI directly, using various factors such as entrepreneurial motivation, need for achievement, entrepreneurship attitude, subjective norms, innovation, personality traits, entrepreneurial orientation, ECs, EM, entrepreneurial education, EMTs, organizational skills, subjective beliefs, and career opportunities [27,59–61]. In Saudi Arabia, EI has been examined through university students' ECs and EM, but the roles played by EM and EMTs in mediating the relationship between ECs and EI still need further exploration [2].

To address these gaps in the existing literature, in this study, we developed a model (see Figure 1) to confirm the effect of ECs on EM, EI, and EMTs among female Saudi Arabian university students.

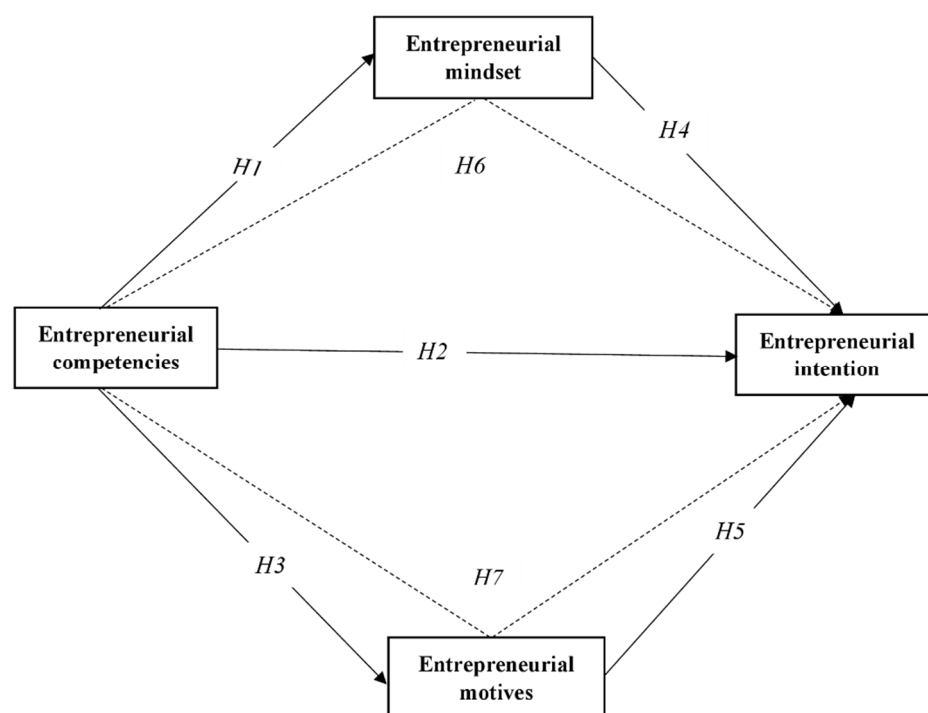


Figure 1. Conceptual model of this study (source, conceptualized by the researchers).

2.5. Entrepreneurial Competencies (ECs) and Entrepreneurial Mindset (EM)

In order to achieve success in any venture, networking is a crucial factor. Entrepreneurial and managerial core competencies are also essential, with ECs being slightly more significant. Specifically, the number of years of entrepreneurial experience, entrepreneurial family background, and family situation are significant factors [62]. Technological intensity and entrepreneurial orientation are the primary drivers of managerial mindset intensity on a global scale [63]. The findings from [64] shed light on how information literacy activities designed to strengthen EM changed students' perceptions. Similarly, Greek science and economic graduates' beliefs were reduced through entrepreneurship education. An entrepreneur's emergence is influenced by various factors such as personal skills, self-assurance, organizational skills, and the adoption of an EM. However, a potential misunderstanding of entrepreneurial principles can lower EI [65]. In the UAE, entrepreneurship is the preferred initial professional path for young people, and environmental and individual factors impact men's and women's EM [66]. However, ref. [67] found differences in partnership accounting and the attainment of social and functional ECs between a project class and a control class. In emerging economies such as Ghana, fostering an international mindset promotes entrepreneurial behaviors that drive SMEs' performances [68].

According to [69], teachers who set an example for students see a significant rise in students' ECs and perceived behavioral controls throughout the semester; however, their attitude toward intention decreases. ECs and EM are significant predictors of SMEs' performances in Nigeria's Benue State [70]. Positive EI development has been linked to female students' ECs related to EM. Among university students who had high EM, there was a high correlation between ECs and EM, but only a moderate correlation between each dimension of self-entrepreneurial competencies [60]. Furthermore, EM mediates the association between ECs and EI [2]. Based on the positive associations found, in this study, we formulated the following hypothesis:

H1. ECs have a positive and significant relationship with EM.

2.6. Entrepreneurial Competencies (ECs) and Entrepreneurial Intention (EI)

Aspiring entrepreneurs who excel at identifying opportunities may require more concrete ideas or exploitable opportunities to pursue. According to the research by [27,69], having an international mindset can enhance the positive effects of innovative entrepreneurial and risk-taking behaviors. Students who are mentored by teachers who serve as role models tend to have higher levels of perceived behavioral control and entrepreneurial confidence, while those who lack such guidance exhibit poorer attitudes toward entrepreneurship.

Entrepreneurship education programs have been shown to positively influence university students' ECs and self-employment intentions, as demonstrated in [14,71]. Competency clusters play significant roles in the development of EI, and there is evidence of a cognitive bias toward overestimation, with certain competency clusters having indirect effects through higher level clusters [72].

In Bali, Indonesia, personality traits significantly influence ECs and EI, with a bidirectional relationship between the two, as reported in [73]. However, in Iran, opportunity alertness is less prevalent, and the most common ECs among adults are self-efficacy, risk taking, and role modeling, although ECs do not translate to increased risk propensity in terms of EI. Instead, Iranians' EIs are primarily influenced by self-efficacy [74].

In contrast to these findings, ref. [75] found no significant connection between entrepreneurial action and recurring entrepreneurial intention behaviors. To investigate whether such associations are positive or negative, we formulated the following hypothesis:

H2. *ECs have a positive and significant relationship with EI.*

2.7. Entrepreneurial Competencies (ECs) and Entrepreneurial Motives (EMTs)

ECs develop students' skills to become successful entrepreneurs [76]. Using multiple regression analysis, the findings by [77] confirmed the relationship between educational attainment, ECs, culture, and EMTs. The findings by [15] underlined the significant effects of ECs on small firm performance and growth. In the Nigerian context, ECs and EO directly influenced SMEs' performances [78]. In Malaysian SMEs, ECs were strong predictors of successful businesses. Compared to more benign and stable contexts, hostile and dynamic environments have shown a stronger correlation between ECs and a successful business [79]. The findings by [80] demonstrated that economic vulnerability substantially damaged commitment, opportunity recognition, organization, and strategic skills. Conversely, the findings showed that, while economic vulnerability had a considerable positive impact on competency, it had a marginally beneficial impact on conceptual competency. Similarly, entrepreneurial learning has direct and indirect effects on ECs and venture growth. Entrepreneurs have used venture expansion as a learning tool to become competent [81]. Factors such as EM, ECs, self-efficacy, and the TBP factors (attitudes, subjective norms, and perceived behavioral control) have been shown to positively affect venture creation and EI [82,83].

The entrepreneurial approach has a clear and positive association with entrepreneurs' strategic and commitment competencies [84]. In Sri Lanka, owners'/managers' background traits directly affect ECs. Based on the positive relationships in the literature, we formulated the following hypothesis:

H3. *ECs have a positive and significant relationship with EMTs.*

2.8. Entrepreneurial Mindset (EM) and Entrepreneurial Intention (EI)

An EM contributes significantly to a student who chooses entrepreneurship as their future employment [66]. In Ukraine's universities, students receiving entrepreneurship-specific education demonstrated a more intense entrepreneurial attitude when they had accumulated more entrepreneurial alertness assets [85]. Entrepreneurship is the first choice for the UAE's young professional people. However, most of them have not yet enrolled in any high school or college formal entrepreneurship courses [66]. According to [86], the determinants of entrepreneurship, professionalism, and leadership are self-efficacy, EI,

entrepreneurial and job outcome expectations, socioeconomic level, and an open personality. Through its ability to innovate, a creative mindset enables successful entrepreneurship. Entrepreneurs who have a growth mentality show and fuel their successes either directly or through their capacity for innovation [87]. The findings by [88] showed that self-efficacy was successful in accelerating university students' EIs. In part, an entrepreneurial culture impacted on entrepreneurship education and EI. In addition, there was a strong association between students' EM and their entrepreneurial culture and schooling. Contrary to predictions, this study's findings did not show that there was a significant relationship between students' EIs and entrepreneurial instruction. According to [89], entrepreneurial education activities influenced entrepreneurial behaviors, and behavioral EM mediated this link. Likewise, entrepreneurial self-efficacy has been reported to be a substantial predictor of identity and education [32]. In the same domain, applying the TPB theory, ref. [90] found a significant positive connection between EI and subjective norms, attitude toward entrepreneurship, and perceived behavioral control among university students. The EM factor was a direct and indirect enabler of a predictor of EI. Similarly, in China, the TBP theory also has a valid and predictive effect on EI, as EM boosts EI [91]. Among science and technology students, entrepreneurship education, the TBP factors (attitude, subjective norms, and perceived behavioral control), and EM positively affect EI [92,93]. In Nigeria, contextual and individual factors have a significant relationship with EI, and self-efficacy partially mediates this relationship [94]. Therefore, we formulated the following hypothesis:

H4. *EM has a positive and significant relationship with EI.*

2.9. Entrepreneurial Motives (EMTs) and Entrepreneurial Intention (EI)

While sympathy and empathy are predecessors of other-oriented motivations, such as charity and social justice, entrepreneurial enthusiasm and impatience lead to self-oriented objectives [95]. An entrepreneurial business is a family's primary source of income [96]. Similarly, ref. [97] tested EI toward perceptions of motives and barriers regarding entrepreneurship. The study's findings pointed to several essential variations between the two sample groups and meaningful connections among the explanatory factors, goals, motives, and impediments. Needs and opportunities both influenced entrepreneurs' informed decisions to launch their businesses. As their initiatives gained more traction, there was also a visibly discernible change in their motivations away from necessity and toward opportunity drivers [36]. The findings by [98] showed that financial motivations were unrelated to either perceived political or governmental, or commercial prospects. However, the anticipation of favorable government policies and marketing possibilities were consistently linked to the drive for recognition. Based on the existing association of EMTs with EI, we formulated the following hypothesis:

H5. *EMTs have a positive and significant relationship with EI.*

2.10. Entrepreneurial Mindset (EM) and Entrepreneurial Motives (EMTs) as Mediators

Entrepreneurship education is crucial to provide students with the knowledge and skills necessary for successful careers in entrepreneurship. By positively influencing entrepreneurial EM and practices, entrepreneurial knowledge plays a key role in mediating the effects of entrepreneurial education and preparation [99]. EM has also been found to accelerate university students' EIs [88]. Entrepreneurial culture is another important factor that influences entrepreneurship education and EI, with a strong link between students' EM and entrepreneurial culture and education [61].

Research has shown that entrepreneurship education increases students' entrepreneurial aspirations by fostering the development of their EM, while also having favorable and significant impacts on entrepreneurial alertness and EM [100]. Furthermore, EM plays a significant mediating role in the relationship between entrepreneurial awareness and education [101]. Creative thinking also has a positive impact on the association between EM and corporate entrepreneurship [102].

In Indonesia, entrepreneurship education is a predictor of students' EIs and EM, with a robust connection between EM and students' EIs [103]. EM also plays a meaningful role in driving entrepreneurial activity toward EI [104]. Entrepreneurship education not only facilitates individual entrepreneurial orientation and EM, but also has a positive association with EI. Moreover, EM significantly mediates the relationship between individual entrepreneurial orientation and EI, as well as between entrepreneurship education and EI [105].

Factors such as risk taking, need for achievement, environmental support, and locus of control are positively and significantly associated with each other, with students' personalities and EM mediating these associations [59]. Social entrepreneurs have also found that other-oriented motives are significantly related to their work, while self-oriented motives are not. Furthermore, the level of perceived work competence mediates the relationship between enthusiasm and job stress, indicating that high levels of work competence can benefit social entrepreneurs' enthusiasm and can strengthen the association between enthusiasm and other-centered goals [106].

Overall, EM and EMTs play significant mediating roles in the relationship between ECs and EI, as evidenced by previous research [61,64,88,103,104]. However, there is a lack of integrated research on the role of EM and EMTs in driving EI [99–101,105,106]. Based on this deficiency, we formulated the following hypotheses:

H6. *EM mediates the relationship between ECs and EI.*

H7. *EMTs mediate the relationship between ECs and EI.*

3. Methods

3.1. Survey Strategy and Respondents

In this study, we used the quantitative technique and numerous quantitative data to explore the link [107]. This approach is excellent and essential to gathering data in a systematic manner [108]. Generally, when conducting either a quantitative evaluation or empirical inquiries, this approach is more commonplace and consistently gives a quantitatively correct representation of society [1,109,110]. In entrepreneurship and, more particularly, in the context of EI, several scholars such as [2,64,67,69,73,89] have applied the quantitate technique to assess EI.

This study was conducted between August 2022 and January 2023. The study's respondents were female students enrolled at different Saudi Arabian public and private universities because they were regarded as potential entrepreneurs and about to make decisions regarding their future professional lives [111,112]. The context of this study is that Saudi Arabia is a developing nation with a rapidly expanding economy [113]. According to [114], a country's unfavorable environmental conditions can make it difficult for women to start businesses. Compared to their Western counterparts, Middle Eastern women face various difficulties, such as social discrimination problems stemming from gender stereotypes, traditional issues, cultural concerns, and business system regime problems [5,115,116]. In Western countries, where laws forbid discrimination, men and women are treated equally. However, there is some gender-based stereotyping in Middle Eastern countries and women are not given the same respect as men [5]. The Saudi government has recently established several programs to encourage female engagement in entrepreneurship. This is despite traditional Saudi conventions representing obstacles for women who want to engage in such activities [6]. Due to women's challenges, there is a need to increase the number of women who can benefit from these initiatives [4]. According to the Saudi Vision 2030, the unemployment rate must drop from 12.9% to 7% [117]. The Saudi Arabian government has committed significant funding to universities to foster their students' entrepreneurial spirits and to inspire them to participate in entrepreneurship [118]. Keeping this in mind, we examined Saudi Arabian university students' ECs, EM, EMTs, and EI.

3.2. Instrument and Reliability

The items on the scales had been previously validated; however, to ensure their validation in the context of Saudi Arabia, we conducted a pilot study to ensure the reliability and validity of the questionnaire [119] which we derived from the literature. In terms of its reliability, we performed the most used method for estimating reliability, namely internal consistency coefficients through using Cronbach's alpha [120]. Consequently, the overall reliability was greater than 0.70 with individual factors and satisfactory scores greater than 0.70 [121]. The study's validity is the degree to which the rules of scientific research methodology are adhered to when producing the research results. This is a prerequisite for all academic research studies [122]. The validity of a study tool is determined by how well it measures what it is intended to measure [123]. Content validity research can provide information on each item's representativeness and clarity along with a preliminary review of its factorial validity. In this regard, field experts/university professors offered constructive feedback about this study's objectives and the quality of the measure of the data collected by the questionnaire [124]. The field experts provided concrete suggestions or recommendations to improve the content of the survey instrument [125]. Therefore, the questionnaire was sent to university professors who were in the entrepreneurship field and were familiar with the research methodology to ensure its content, format, and design. The phrasing of each question was straightforward and understandable to the chosen sample, and therefore, there were no issues. Consequently, after making some minor modifications, we distributed a reliable and valid questionnaire to collect large-scale data.

3.3. Data Collection and Sample Size

We used the questionnaire, both online and offline, to collect data from the targeted female university students enrolled at different Saudi Arabian public and private universities. The study's target population was all female students pursuing their undergraduate and graduate degrees. Because most previous EI research studies had included samples of college students, we concentrated on university-based female students since they would be making decisions about their future professional careers and were prospective entrepreneurs. We applied convenience sampling since it was the optimum method for online and offline surveys [126]. We visited the Saudi Arabian universities and sent e-mails to a select group of students and WhatsApp groups along with links to the questionnaire. We attached a covering page describing the study's objectives and the students' voluntary participation. We also assured the respondents about the privacy and confidentiality of their responses.

We distributed 600 questionnaires to the students and received back 388 samples which represented a 64% response rate. We found no cases with less than 5% and no outlier cases. Therefore, we based the final analysis on 388 valid cases.

We used G*Power (version 3) to calculate the required sample size, which is a good freeware program that determines statistical power for sample size analysis in behavioral research for the most common statistical tests [127,128]. We used all four variables to guarantee a sufficient sample size. Therefore, G*Power stated that 100 samples were required to conduct the SEM analysis, and to fulfil the AMOS software's requirement.

Having collected the data, we applied a *t*-test to identify the mean difference between both sampling modes. We found a significant difference in mean scores at <0.005 ** or a two-tailed significance level (see Table 1). In this way, we accomplished the existence of probably a statistical difference between the online and offline samples [129] and in doing so, ensured no assumption either of response bias or common variance.

Table 1. Mean difference in offline and online samples.

Offline	Online	df	Sig.(2-Tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
230 (59.28%)	158 (40.72%)	321	<0.005 **	5.007	2.624	4.725

The explanation of **. $p < 0.001$

3.4. Measures

Entrepreneurial Competencies (ECs)

ECs underline an individual's skills, capabilities, or proficiencies utilized to develop entrepreneurial and financial plans, enterprise management models, resources, and novel ideas to succeed in a business [130,131]. We used six items adopted from [10,130,131] to measure ECs. A sample item is: "I can develop an entrepreneurial proposal".

Entrepreneurial Mindset (EM)

An EM underlines an individual's capacities to perceive, act, and mobilize in ambiguous situations [28]. It shows an individual's interest, motivation, and inspiration to be involved in an entrepreneurial activity, a new business, and to create a new venture [132–134]. We used four items, adapted from [132–135], to measure EM. A sample item is: "I am interested in entrepreneurial activities".

Entrepreneurial Motives (EMTs)

EMTs underline an individual's drive or motivation toward entrepreneurship, where they want to be self-employed, serve, and host a society; they want to be richer and to develop their entrepreneurial careers, which attracts them, and entrepreneurship runs in their blood [136]. We used three items, adopted from [136], to measure EMTs. A sample item is: "A career as an entrepreneur is attractive for me".

Entrepreneurial Intention (EI)

EI refers to an individual's conscious state of mind toward performing an entrepreneurial behavior, i.e., becoming an entrepreneur and launching a new business in the future [8,10]. We used six items, adopted from [2] as utilized by [130,137–139], to measure EI. A sample item is: "I have decided on a new creation in the future".

We evaluated all the items by using a five-point Likert scale based on the following options: strongly agree = 1, agree = 2, neutral = 3, disagree = 4, and strongly disagree = 5.

4. Analysis

4.1. Demographic Indicators

The researchers observed a few demographic indicators such as age, university, and discipline, to understand the dynamics of the study population. We collected the data from a total of 388 respondents; 71.40% ($n = 277$) of the students who contributed to this study were from 21 to 30 years old, 23.45% ($n = 91$) were aged below 20 years, and 5.15% ($n = 20$) were 31 years and above. Related to the universities, most respondents (68.56% or $n = 266$) were from public universities, and 31.44% ($n = 122$) were from private universities. Regarding disciplines, most students (24.74% or $n = 96$) were from engineering, 24.23% ($n = 94$) were from management, 22.16% ($n = 86$) were from business, 19.85% ($n = 77$) were from information technology, and only 9.02% ($n = 35$) were from other disciplines (see Table 2).

Table 2. Demographic indicators.

Indicator	Characteristics	Samples	Percentage
Age (years)	<20 years	91	23.45
	21–30	277	71.40
	31 and above	20	5.15
	Total	388	100.0

Table 2. *Cont.*

Indicator	Characteristics	Samples	Percentage
University	Public	266	68.56
	Private	122	31.44
	Total	388	100.0
Discipline	Engineering	96	24.74
	Business	86	22.16
	Management	94	24.23
	Information technology	77	19.85
	Others	35	9.02
	Total	388	100.0

4.2. Measurement of Model Assessment

We conducted factor loading to determine the correlation coefficients between the constructs. Most items had loading values larger than 0.70 or were within a range between 0.701 (emts7) and 0.890 (em1). However, certain items, including ecs4, emts2, emts8, emts11, and ei4, were disqualified because either their loading weights needed to be increased or their required values needed to be met [121]. Likewise, we noted that the composite reliability (CR) values ranged from 0.761 (EMTs) to 0.800 (EM) or were higher than the suggested values (0.70) (see Table 3). We computed the average variance extracted (AVE) values to identify and to evaluate the elements further. Accordingly, all the AVE construct values were between 0.781 and 0.826, this is more than 0.50 and is regarded to be excellent [121]. Finally, we used Cronbach's alpha reliability to evaluate the items' internal consistency. We noted that Cronbach's alpha ranged from 0.820 (for EMTs) to 0.873 (EI). This shows a satisfactory dependability for all factors (>0.70) (see Table 3).

Table 3. Measurement model.

Construct	Code	Loadings	CR	AVE	α
Entrepreneurial competencies (ECs)	ecs1	0.882	0.798	0.792	0.869
	ecs3	0.866			
	ecs2	0.857			
	ecs5	0.838			
Entrepreneurial mindset (EM)	em1	0.890	0.800	0.781	0.882
	em2	0.867			
	em3	0.833			
	em4	0.829			
Entrepreneurial motives (EMTs)	emts1	0.878	0.761	0.799	0.820
	emts3	0.859			
	emts5	0.828			
	emts4	0.810			
	emts9	0.798			
	emts13	0.765			
	emts10	0.749			
	emts12	0.730			
	emts6	0.719			
Entrepreneurial intention (EI)	emts7	0.701	0.789	0.826	0.873
	ei1	0.872			
	ei2	0.862			
	ei3	0.844			
	ei6	0.820			
	ei5	0.808			

Note: CR, square of the summation of the factor loadings; AVE, summation of the square of the factor loadings; α , Cronbach's alpha.

It is also essential to have a well-fitting measurement model before studying causal pathways in a structural model [140]. If good-fitting models are consistent with the data,

these can be re-specified. Before assessing the hypotheses, we evaluated the model fit to identify its ability to replicate the data (i.e., usually the variance-covariance matrix). As shown in Table 4 and Figure 2, the chi-square/df values are 2.270 and, thereby, ensure the model's initial compatibility with the data. In addition, within the acceptable scores suggested by researchers such as [140–142], we discovered other model fit indicators such as CFI, GFI, AGFI, NFI, and RMSEA (Table 4).

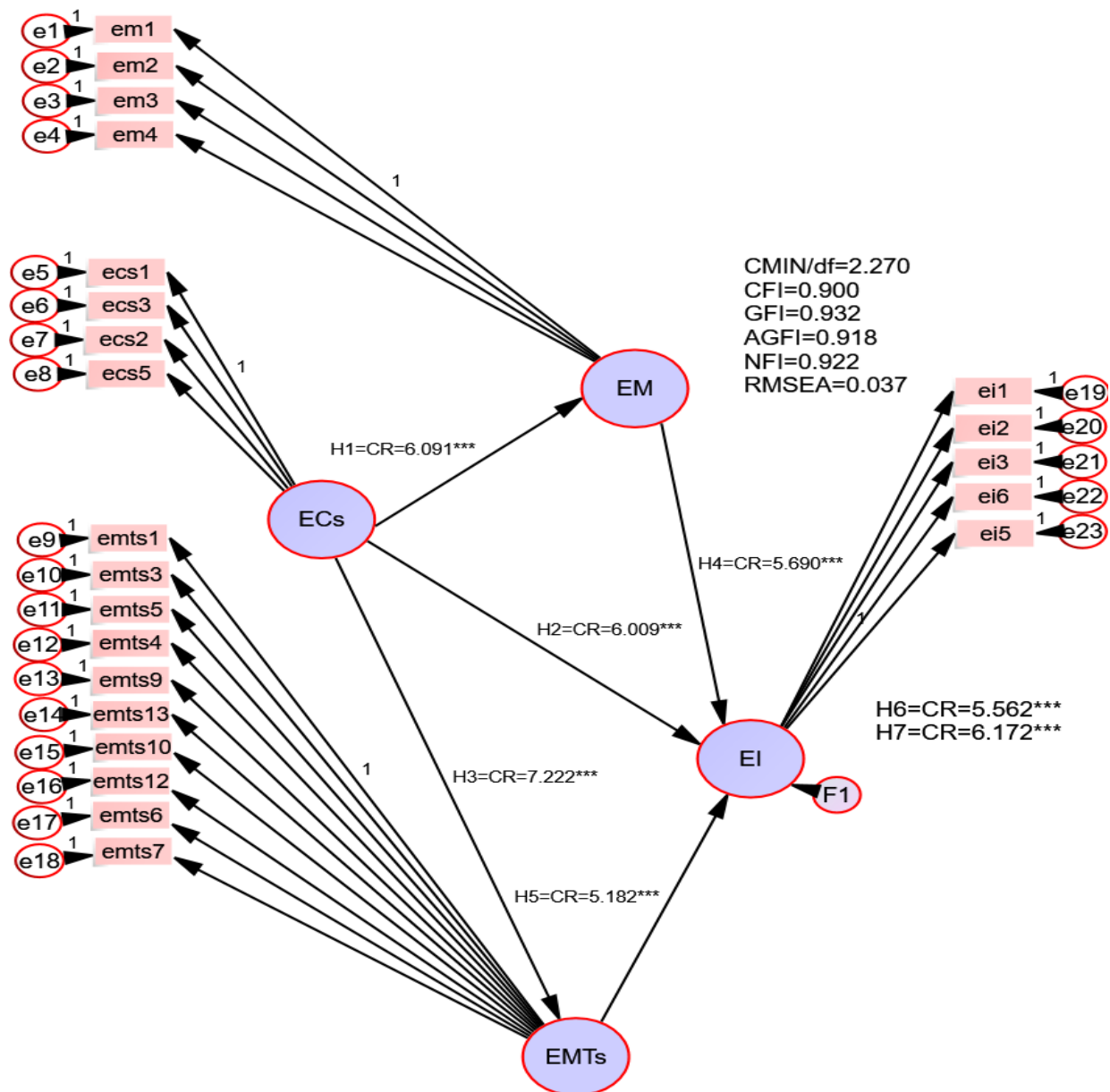


Figure 2. Structural equation model (source, authors' own estimation). Note: CR, critical ratio; *** $p < 0.05$; ECs, entrepreneurial competencies; EM, entrepreneurial mindset; EMTs, entrepreneurial motives; EI, entrepreneurial intention; CMIN, χ^2 /chi-square/df; df, degrees of freedom; GFI, goodness-of-fit index; AGFI, adjusted goodness-of-fit index; NFI, normed fit index; CFI, comparative fit index; RMSEA, root mean square error of approximation.

Table 4. Model fit indices and their acceptable thresholds.

Goodness of Fit Indices	Achieved Value	Acceptance Level
Chi-square/df	2.270	<5.0
CFI	0.900	>0.90
GFI	0.932	>0.90
AGFI	0.918	>0.85
NFI	0.922	>0.90
RMSEA	0.037	<0.08

Note: CMIN, χ^2 /chi-square/df; df, degrees of freedom; GFI, goodness-of-fit index; AGFI, adjusted goodness-of-fit index; NFI, normed fit index; CFI, comparative fit index; RMSEA, root mean square error of approximation.

4.3. Structural Model Assessment

We applied a SEM path analysis to assess the developed hypotheses. The analysis shows that EMTs have a positive and significant effect on EI ($H5 = SE = 0.029$, $CR = 5.182$, *** $p < 0.01$). Turning to the direct paths, as shown in Table 5 and Figure 2, these confirm that ECs have a positive and significant relationship with EM ($H1 = SE = 0.024$, $CR = 6.091$, *** $p < 0.01$). Therefore, hypothesis H1 is accepted. Likewise, ECs have a positive and significant relationship with EI ($H2 = SE = 0.032$, $CR = 6.009$, *** $p < 0.01$). Therefore, hypothesis H2 is accepted. By showing the positive and significant paths ($H3 = SE = 0.026$, $CR = 7.391$, *** $p < 0.01$), the analysis also demonstrates the association between ECs and EMTs. Therefore, hypothesis H3 is accepted. The analysis also shows that EM has a positive and significant predictive power on EI, ($H4 = SE = 0.026$, $CR = 5.690$, *** $p < 0.01$). Therefore, hypothesis H4 is accepted. Finally, EMTs have a positive and significant effect on EI ($H5 = SE = 0.029$, $CR = 5.182$, *** $p < 0.01$) (see Table 5 and Figure 2). Therefore, hypothesis H5 is accepted.

Table 5. SEM estimations (direct paths).

H.No	Independent Variables	Path	Dependent Variables	Estimate	SE	CR	<i>p</i>	Decision
H1	ECs	→	EM	0.288	0.024	6.091	***	Accepted
H2	ECs	→	EI	0.241	0.032	6.009	***	Accepted
H3	ECs	→	EMTs	0.249	0.026	7.391	***	Accepted
H4	EM	→	EI	0.032	0.026	5.690	***	Accepted
H5	EMTs	→	EI	0.239	0.029	5.182	***	Accepted

Note: SE, standard error; CR, critical ratio; *** $p < 0.05$; ECs, entrepreneurial competencies; EM, entrepreneurial mindset; EMTs, entrepreneurial motives; EI, entrepreneurial intention

Moreover, in relation to the indirect paths, the analysis shows that EM has an indirect effect on EMTs in developing the association between ECs and EI ($H6 = SE = 0.020$, $CR = 5.562$, *** $p < 0.01$ and $H7 = SE = 0.023$, $CR = 6.172$, *** $p < 0.01$ (see Table 6 and Figure 2). Therefore, hypotheses H6 and H7 are accepted.

Table 6. SEM estimations (indirect paths).

H.No	Independent Variables	Path	Mediator	Path	Dependent Variables	Estimate	SE	CR	<i>p</i>	Decision
H6	ECs	→	EM	→	EI	0.211	0.020	5.562	***	Accepted
H7	ECs	→	EE	→	MTE	0.230	0.023	6.172	***	Accepted

Note: SE, standard error; CR, critical ratio; *** $p < 0.05$; ECs = Entrepreneurial competencies; EM = Entrepreneurial mindset; EMTs = Entrepreneurial motives; EI = Entrepreneurial intention.

5. Discussion and Conclusions

In this study, we explored the relationships of ECs with EI among Saudi Arabian female university students. We also examined the mediating roles of EM and EMTs. The findings show that ECs have positive and significant effects on EM, EI, and EMTs. These

positive findings are consistent with those of previous studies such as [62–64,69,71,73,79,80]. These findings demonstrate that female students can create business plans and can realize enterprise management models. They have access to business resources. At various phases, they can carry out the financial strategy for entrepreneurship development. They can apply creative concepts to marketing. They have an interest in business ventures. They aim to start their own businesses. They will launch a new business if they have the opportunity and the resources. They will choose a brand new creation from among the available professional options. They want more profound integration with the host culture. Their entrepreneurship aids their integration. The benefits of being an entrepreneur outweigh the drawbacks. They find an entrepreneurial profession appealing. Being an entrepreneur is incredibly satisfying. They prefer having their own businesses to being in stable employment. When people work for themselves, they can earn a good income. Rather than managing an existing company, they prefer to start their own businesses. They desire independence. They like the freedom that working for themselves provides. Their blood is infused with entrepreneurship. They desire financial success.

This study's findings demonstrate that EM has a positive and significant effect on EI. These findings are consistent with the findings by [87–89,94]. EM significantly contributes to students choosing entrepreneurship as their future employment and careers. The students can create an entrepreneurial proposal while also developing positive EI. They also recognize the significance of enterprise management models in improving EI. They can acquire entrepreneurial resources and can set a financial plan for various stages of entrepreneurial development and, more particularly, for EI. They intend to apply their novel ideas to the advancement of marketing.

In addition, this study's findings demonstrate that EMTs have a positive and significant effect on EI. Likewise, these findings are consistent with those of previous studies such as [95–98]. Saudi Arabian female university students are interested in entrepreneurial activities. They want to be business owners based on the assumption that they will start a new business if they have enough opportunities and resources. They will choose a new business from among the various career options and because of such factors, they may develop an interest in entrepreneurship. The mediating effects show that EM and EMTs are the significant factors which develop the association between ECs and EI. The indirect relationship between these factors suggests that they have decided to create something new in the future. Five years following graduation, they will have started new businesses since they have prepared and made plans to be business owners. They are confident in their ability to launch a successful new business. EM and EMTs reinforce all these intentions and improve the connection between ECs and EI.

In summary, this study's overall findings show that ECs, EM, and EMTs reinforce EI. The findings also confirm the positive predictive power of EM and EMTs on EI. This significantly enhances EI among female university students. Moreover, EM and EMTs indirectly develop the relationship between ECs and EI. These connections make possible the enhancement of EI through entrepreneurial education and university education in IT, management, business, and engineering.

6. Study Implications

6.1. Managerial Implications

This findings of this study have several implications for policymakers, educators, and business leaders. First, efforts should be made to develop and implement entrepreneurship education programs that are targeted specifically at female university students and are focused on enhancing their ECs, EM, and EMTs. Second, universities should establish mentoring and coaching programs to provide female students with guidance, support, and role models as they explore entrepreneurship. Finally, policymakers should implement policies and initiatives that address the social and cultural barriers that limit Saudi Arabian women's participation in entrepreneurship. This can be done through providing access to financing, improving the legal and regulatory environment, and promoting gender equality.

6.2. Theoretical Implications

This study makes several important contributions to the literature on entrepreneurship and EI among Saudi Arabian female university students. First, it highlights the critical role played by ECs in shaping EI. This underpins the importance of enhancing ECs among Saudi Arabian female university students as key drivers of entrepreneurship. Second, the findings demonstrate the crucial mediating role played by EM and EMTs in linking ECs to EI. These findings demonstrate that, in addition to developing ECs, efforts should be made to promote greater EM and EMTs among female university students to increase the likelihood of their pursuing entrepreneurship. Finally, this study's findings shed light on the unique context of female entrepreneurship in Saudi Arabia where gender norms and social barriers have often limited women's participation in the labor force and entrepreneurship. This study's findings can inform policies and programs aimed at increasing women's participation in entrepreneurship and in promoting gender equality.

7. Limitations and Future Research Directions

One limitation of this study was that it relied on cross-sectional data. This limited our ability to draw causal conclusions about the relationships among ECs, EM, EMTs, and EI.

Consequently, we recommend that future research studies should use either longitudinal designs or experimental methods to establish the causal relationships among these variables. In addition, this study only focused on Saudi Arabian female university students, and therefore, the findings cannot be generalized to other contexts or populations. Consequently, the researchers recommend that future research studies should explore the relationships between these variables in other populations such as male university students, working professionals, or entrepreneurs. Finally, this study did not examine the influence of contextual factors, such as the social and cultural environment, on the relationships between these variables. Consequently, the researchers recommend that future research studies should explore how these contextual factors shape the relationships among ECs, EM, EMTs, and EI among Saudi Arabian female university students and other contexts.

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