

# Context, gender and entrepreneurial intentions

## How entrepreneurship education changes the equation

Context,  
gender and  
entrepreneurial  
intentions

75

Anne Rienke van Ewijk

*College of Business, Abu Dhabi University, Dubai,  
United Arab Emirates, and*

Sophia Belghiti-Mahut

*College of Business, Abu Dhabi University, Al Ain,  
United Arab Emirates and Universite Paul-Valery Montpellier, Montpellier, France*

Received 31 May 2018  
Revised 6 November 2018  
4 December 2018  
Accepted 5 December 2018

### Abstract

**Purpose** – This paper aims to explore how gender differences in entrepreneurial intentions (EI) change when entrepreneurship education (EE) is added to the force field of macro-social stimulants and inhibitors of female EI in the particular context of the United Arab Emirates (UAE).

**Design/methodology/approach** – The study is based on a pre-post survey with entrepreneurship students and students with a similar profile enrolled in other courses ( $N = 246$ ) at three universities. The three main hypotheses are evaluated through independent-samples *t*-tests and a hierarchical multiple regression analysis.

**Findings** – The findings indicate a negative effect of gender stereotypes on female students' EI in the UAE, regardless of the course type. Furthermore, entrepreneurship courses appear to be more successful than other courses in raising the EI of students in general and female students in particular. Finally, adding EE to the equation of macro-social inhibitors and stimulants of female EI in the UAE seems to tip the balance in favor of the influence of economic affluence, rapid modernization and proactive governmental policies to stimulate the entrepreneurial spirit among female residents. That is, at the end of the entrepreneurship courses, there was no significant gender difference in EI anymore and female students are significantly more likely to experience a positive change in EI than male students.

**Research limitations/implications** – The literature review identifies the need for future studies to evaluate the impact of variability in sampling and methods among previous studies on gender effects in EE. Building on the findings, future studies could identify which aspects of EE are pivotal for customizing female students' specific local interests and needs. The study is limited in the sense that the data set did not enable tests of moderators at the course level (which mostly requires more qualitative data) and individual level. In addition, the sample is not representative for all female residents in the UAE at large.

**Practical implications** – This study might stimulate (UAE) policymakers to increase the scope and quality of EE. In turn, university administrators are recommended to find ways to compensate the self-selection effect (overcome likely opt-out by female students) when entrepreneurship courses are elective.

This study is based on data extracted from an international research project regarding the impact of EE funded by the Office of Research and Sponsored Programs of Abu Dhabi University with a “faculty research incentive grant” awarded to Dr. Anne R. van Ewijk in the academic year of 2015-2016. In particular, the authors would like to express gratitude towards Dr Sara Carter for her professionalism in handling the manuscript and the anonymous peer reviewers of the IJGE who provided us with valuable constructive feedback that helped to improve the manuscript substantially.



**Originality/value** – This exploration was inspired by the strong emphasis that Julie Weeks put on the gendered impact of macro-level factors in business enabling environments (Weeks, 2011). The empirical analysis builds on a conceptual framework that integrates Krueger's model of EI, theory on gender stereotypes in entrepreneurship and previous literature on the role of EE (reinforcing or mitigating stereotypes). The study is executed in the relatively unexplored context of the UAE, which offers strong macro-social inhibitors for and stimulants of female entrepreneurship.

**Keywords** Gender theory, Stereotypes, Entrepreneurial intentions, Entrepreneurship education and training, Socio-cultural context

**Paper type** Research paper

## 1. Introduction

Globally, fewer women than men are entrepreneurs (GEM, 2018). Women's businesses are also generally smaller and less growth-oriented than those owned by men (Coleman, 2007). This is not due to lack of potential; their business are more similar than different when controlling for particular weaknesses related to female entrepreneurs, e.g. lack of network or management experience (Neergaard *et al.*, 2005). Likely, it is because women have lower intentions of becoming entrepreneurs (Santos *et al.*, 2016). Similar gender differences are visible in the UAE. Only 5.6 per cent of established business owners and 9.0 per cent of adults who have started or are running a business up to 3.5 years in the UAE are women (GEM, 2018), and Emirati men are twice more likely to have intentions for launching and managing a new business than Emirati women (El-Sokari *et al.*, 2013).

Entrepreneurship education (EE) is commonly viewed as a means to enhancing entrepreneurship by promoting an entrepreneurial career (Krueger and Brazeal, 1994). Might EE also alleviate gender differences in entrepreneurial intentions (EI)? Previous literature on the gendered impact of EE provides an ambivalent answer. While some studies find stronger positive effects of EE on female students (Wilson *et al.*, 2007), other studies report that female students benefit less (Joensuu *et al.*, 2013; Westhead and Solesvik, 2016; Shinnar *et al.*, 2014) or that there is no significant gender effect at all (Bae *et al.*, 2014).

This paper will outline several explanations for these mixed results, such as variability in sampling and data analysis techniques. In line with the thoughts of Julie Weeks, the *raison d'être* of this special issue, this study focuses on the diversifying influence of context. Weeks (2011) emphasized the gendered impact of macro-social factors on business enabling environments. This paper translates that thought into a conceptual framework which integrates Krueger's model of EI (Krueger *et al.*, 2000), theory on gender stereotypes in entrepreneurship (Bird and Brush, 2002) and previous studies on the potential role of EE.

From this perspective, the UAE provides a particularly interesting context. On the one hand, negative entrepreneurial gender stereotypes might be strong, as most residents – the majority of them being non-Emirati – originate from cultures that harbor traditional (religious) values. In addition, the UAE adheres to a legal system based on religious patriarchal values (Goby and Erogul, 2011). On the other hand, the UAE constitutes a strong and growing economy, modernizing at great speed, with specific attention for the participation of women in the labor market in general and for creating a supportive entrepreneurial eco-system in particular (Goby and Erogul, 2011; Tlaiss, 2015). In this macro-social context, will EE – more than other types of education – have a positive or negative effect on EI of students in general and of female students in particular?

With that research question in mind, the study tests for differences in students' EI related to course type (entrepreneurship vs other) and gender (male vs female) – at the start and at the end of the course. In addition, a hierarchical regression analysis demonstrates the explanatory power of gender on the change in EI over and above that of other predictors.

The sample consists of entrepreneurship students and students with a comparable profile (similar in age range and gender ratio) enrolled in a different course for the same program at the same university in the same semester. The data are extracted from a broader international data collection project on the impact of EE that took place in the academic year of 2015-2016. The selected sample consists of 246 students from three universities in the UAE.

The rest of this paper outlines the literature review, hypotheses, methodology and findings. In continuation, the discussion provides specific suggestions for future research, while the conclusion dedicates explicit attention to the study limitations.

## 2. Literature review

### *2.1 Gender effects in EE: mixed findings, methodologies and sampling strategies*

Empirical findings on gender effects regarding the impact of EE directly contradict each other. One highly cited paper (Wilson *et al.*, 2007) demonstrates that effects of EE on entrepreneurial self-efficacy are stronger for female students than for male students. More specifically, entrepreneurship programs for female students only are found to enhance participants' self-esteem (Cooney, 2009), develop capital and entrepreneurial competences (Roomi and Harrison, 2010) and improve female networking skills (Tynan *et al.*, 2009). In contrast, other studies find that female students' EI decreased more than those of their male counterparts during EE (Joensuu *et al.*, 2013), female students did not significantly experience an increase in entrepreneurial self-efficacy, while male students did (Shinnar *et al.*, 2014) and female students were significantly less likely than male students to report high intensity of EI after EE (Westhead and Solesvik, 2016). Finally, a meta-analysis by Bae *et al.* (2014) found that the moderating effect of gender on the relation between EE and EI was not significant.

A closer look into research designs and sample characteristics might help to explain these seemingly contradictory findings. First, it should be noted that some studies derive their conclusions from a comparison of scores between entrepreneurship students and other students at only one specific point in time; either before, during or after a course (Westhead and Solesvik, 2016). These data can generate insights into differences between female entrepreneurship students, their male counterparts and other students in terms of characteristics, expectations or preferences. In turn, those insights may lead to sharpening understanding as to how EE should be presented and designed to encourage female participation within the entrepreneurial arena in future (Petridou *et al.*, 2009). However, these type of data are not sufficient to support conclusions regarding the impact of EE; at a minimum, this requires a pre-post measurement (Rideout and Gray, 2013). Critically checking whether statements regarding the impact of EE are based on the results of one-time measurements and disregarding these stretched interpretations may dissolve some of the ambiguity.

Second, there is considerable variation in the sample characteristics in terms of what constitutes an entrepreneurship student. Most gender studies in EE share a focus on undergraduate students, enrolled in an elective entrepreneurship course or program. However, some samples consist exclusively of business students (Westhead and Solesvik, 2016), while others include multiple academic disciplines (Joensuu *et al.*, 2013). Samples with very particular characteristics are often a consequence of convenience sampling, which is quite common in educational settings (Cohen *et al.*, 2011). If these sample characteristics are related to covariates that might affect research results, generalizing conclusions becomes risky and comparisons might become inappropriate (also Lucas, 2003; Farrokhi and Mahmoudi-Hamidabad, 2012). In sum, ambiguity due to mixed findings might be

diminished by explicitly specifying basic sample characteristics when citing studies to reinforce arguments. For example, [Wilson et al. \(2007\)](#) are often cited to indicate that EE has a positive impact on female students, but their data only comprise a one-time measurement of MBA students who were mostly majoring in Finance.

### *2.2 Conceptual framework: integrating the EI model and gender stereotype theory*

In honor of the work of [Weeks \(2011\)](#), leading advocate of female entrepreneurship, this paper builds on an alternative, theory-driven, explanation for previous mixed findings: EE functions as a moderator of the gender differentiated impact from various contextual factors on EI. The EI model ([Krueger et al., 2000](#)) describes how macro-social factors influence perceived social norms and self-efficacy. In turn, perceived social norms and self-efficacy affect perceived desirability and feasibility, the most immediate predictors of EI. The EI model is widely used and has received ample empirical support ([Schlaegel and Koenig, 2014](#)). Studies on the gendered impact of EE originate from very different countries, e.g. Finland ([Joensuu et al., 2013](#)), USA ([Wilson et al., 2007](#); [Shinnar et al., 2014](#)) and Ukraine ([Westhead and Solesvik, 2016](#)). Each of these countries constitutes a distinct socio-cultural or macro-social environment that influences occupational choices, such as starting up a business, and plays a vital role in determining entrepreneurial behavior in general ([Wilson et al., 2004](#); [Thornton et al., 2011](#)). Previous studies have demonstrated that social norms tend to vary between countries due to different cultures ([McGrath and MacMillan, 1992](#)). One important aspect of those macro-social environments consists of gender stereotypes in entrepreneurship. Previous studies demonstrate how these stereotypes affect direct predictors of EI, such as perceived entrepreneurial self-efficacy by female students ([Marlino and Wilson, 2003](#)). EE, then, might either reinforce or mitigate these stereotypes, thereby reinforcing the effect of either macro-social inhibitors or stimulants. This conceptual framework provides the theoretical basis of the study and is further elaborate below.

Among the most frequently mentioned macro-social inhibitors of EI among women are gender stereotypes in entrepreneurship. The concept of gender stereotypes was introduced in 1973 by [Schein \(1973\)](#). Schein demonstrated how descriptive and prescriptive gender stereotypes, i.e. perceptions of how men and women are and should be, formed a major barrier to women's entry into management in the USA in 1973 and continued to do so in 2001 ([Schein, 2001](#)). In particular, women were perceived as less likely than men to possess the characteristics, attitudes and behaviors required of successful managers ([Schein and Davidson, 1993](#)). These gender stereotypes, in combination with socially related perceptions of what it means to be masculine or feminine, are also strong deterrents for women toward entrepreneurship ([Bird and Brush, 2002](#); [Gupta et al., 2009](#)). The discourse surrounding entrepreneurs is generally highly masculinized, giving rise to a perceived incongruity between the female gender role and the entrepreneur role by men and women alike ([Ahl and Marlow, 2012](#)). For example, women display fewer of the masculine characteristics that are typically associated to entrepreneurship behavior, e.g. risk-taking ([Patterson et al., 2012](#)). Women, and especially young women, perceive themselves as having a lower level of self-efficacy in entrepreneurship ([Marlino and Wilson, 2003](#)). This form of self-stereotyping by women was found to block EI and entrepreneurial behavior ([Marlow and McAdam, 2012](#)). Experiences of prejudice by their social environment ([Iakovleva et al., 2011](#)) or potential resource providers ([Wu and Chua, 2012](#); [Xu et al., 2018](#)) were found to significantly hinder women in their intent to become entrepreneurs. These stereotypes may be expected to manifest themselves stronger in cultures with traditional values ([Pruett et al., 2009](#)). For example, [Sharma \(2018\)](#) found strong cultural deterrents when comparing regional cultures in India and [Roomi et al. \(2018\)](#) identified various normative barriers for Pakistani women to

opt for entrepreneurial career choices. Nevertheless, Santos *et al.* (2016) found that gender stereotypes regarding entrepreneurship were consistent and influential in developed/Western regions as well, i.e. southern Britain and southern Spain. Meyer *et al.* (2017) provide a particularly convincing quantitative demonstration of how gender role stereotypes affect the image of entrepreneurs among young adults.

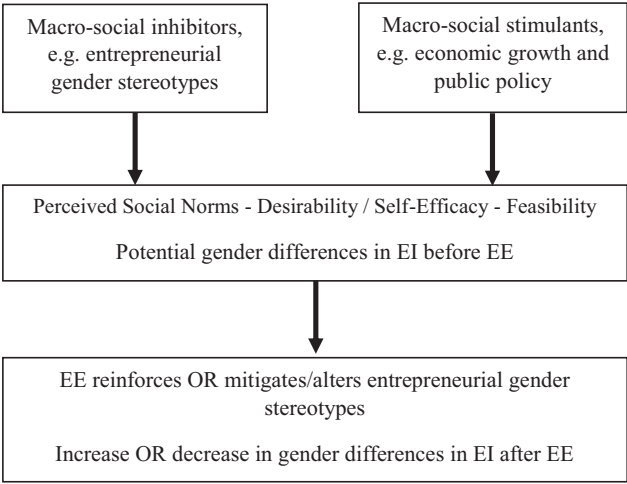
Previous studies have also identified specific macro-social stimulants that stimulate entrepreneurial thinking, aspirations and behavior by women. For example, high economic growth may create a favorable climate for entrepreneurship (Verheul *et al.*, 2006). Furthermore, governmental publicity campaigns and employment policies may stimulate gender mainstreaming (Rubery, 2002). Particular combinations of these, and other, factors might even lead to a re-interpretation of stereotypical roles for women to include entrepreneurial activities as appropriate behavior (Tlaiss, 2015).

Finally, the literature on EE and gender hypothesizes that this type of education may change the equation in two opposite ways. On the one hand, it may reproduce or reinforce the stereotype of the “heroic male” entrepreneur (Achtenhagen and Welter, 2011). Particularly, when it presents female students with an image of entrepreneurship that is unlikely to fit their personality (Menzies and Tatloff, 2006) or when it does not take into account that there are gender differences in the manner in which self-beliefs and attitudes about entrepreneurship are processed and developed (Wilson *et al.*, 2007). EE might also be less beneficial because it is simply unable to counterbalance prevalent gender stereotypes, as expected by Joensuu *et al.* (2013) and Westhead and Solesvik (2016). On the other hand, EE might tip the balance in favor of macro-social stimulants of entrepreneurial thinking, aspirations and behavior among women, if only by raising more awareness regarding these factors among female students. In addition, EE might mitigate and/or change gender stereotypes (Byrne and Fayolle, 2010; Liñán *et al.*, 2011) by adapting its content to the particular expectations and needs of female students. A female-only setting would support this customization (Cooney, 2009; Tynan *et al.*, 2009). Figure 1 summarizes this conceptual framework.

### 2.3 The case of the UAE: background and hypotheses

The UAE is a highly diverse society in terms of nationalities. For example, local Emirati population in the emirate of Dubai amounts only to 8.7 per cent (Dubai Statistics Center, 2017). The largest group of non-Emirati nationals comes from South Asia (58 per cent) or other parts of Asia (17 per cent), while Western expatriates only constitute 8.5 per cent of the population (World Population Review, 2018). This implies that most residents originate from non-Western cultures that are more likely to harbor traditional values. Interviews with female entrepreneurs confirm the continued existence of gender stereotypes in the UAE (Tlaiss, 2015). In addition to that, the UAE harbors a legal system that is still strongly based on religious patriarchal values, creating certain constraints for women in business ventures (Goby and Erogul, 2011). In sum, these macro-social inhibitors are assumed to have a strong deterring effect on the EI of female students.

On the other hand, there are multiple macro-social factors that are likely to stimulate female entrepreneurship. The UAE is modernizing at great speed. Income levels of residents with higher education are high. The environment for innovation and entrepreneurship is positive in terms of a large and international private sector, numerous incubators and increasing venture capital as well as strong push from the government to increase women’s participation in the workforce in general and the development of new ideas and ventures in particular (Goby and Erogul, 2011; Tlaiss, 2015). The UAE National Innovation Strategy, in particular, announced in 2014, aims at



**Figure 1.**  
Conceptual  
framework

**Note:** This figure integrates Krueger’s entrepreneurial intentions (EI) model, gender stereotypes and the role of entrepreneurship education (EE)

making the country one of the most innovative nations in the world and therefore “strives to instill an entrepreneurial culture in schools and universities to foster generations endowed with leadership, creativity, responsibility and ambition” (Vision 2021, 2016). This creates a macro-social context that is different from developed countries, but also quite distinct from other rapidly modernizing economies, such as South-Korea (Gupta *et al.*, 2012).

Previous findings seem to indicate that EE in the UAE is more likely to reinforce macro-social stimulants than inhibit EI among female students. By means of background, only few of the 71 universities in the UAE offer an entrepreneurship major/minor, but many universities have started offering entrepreneurship courses (Ashour, 2016). All studies in the UAE regarding the impact of EE are based on one-time comparisons of male and female Emirati business students’ EI (Gallant *et al.*, 2010; Ryan *et al.*, 2011; Majumdar and Varadarajan, 2013), which makes it unclear what effect type of education has. However, female Emirati business students’ expectations of EE are found to be very positive (Gallant *et al.*, 2010) and “need for achievement,” a proven determinant of EI, was found to be significantly higher among female students (Ryan *et al.*, 2011). Also, adapting the content of an entrepreneurship course to the particular expectations and needs of female students is apparently easier done in a female-only setting (Cooney, 2009; Tynan *et al.*, 2009), and many undergraduate degrees in the UAE are offered in a gender-segregated setting (El-Gohary *et al.*, 2016). As such, the study assesses the following hypotheses:

*H1.* In the UAE, negative gender stereotypes regarding entrepreneurship are strong: provoking lower EI from female students in general (*H1a*) and from female entrepreneurship students in particular (*H1b*).

---

H2. In the UAE, entrepreneurship courses increase EI more than other courses.

H3. In the UAE, entrepreneurship courses alleviate gender differences in EI.

Context,  
gender and  
entrepreneurial  
intentions

### 3. Methodology

#### 3.1 Data collection procedure and sample characteristics

To test the above hypotheses, data on bachelors and masters students were extracted from a wider international research project on EE that facilitating multiple studies with different scopes and objectives (van Ewijk and Al-Aomar, 2016). These students followed business or engineering courses in three universities in the UAE: one in Abu Dhabi and two in Dubai. While their selection is based on convenience (instructors responded to a call for participation), the student population of these universities combined can be considered as reasonably representative for all students registered at over 70 licensed higher education institutions in the UAE (MOHESR, 2014), due to certain characteristics. First, in terms of legal denomination. From the three universities, two are private and one is public. Second, in terms of student nationalities. Students at the public university are mostly local, with the Emirati nationality. One of the private universities caters to one of the largest immigrant population in the UAE, from India, while the other private university hosts a highly diverse mix of students with mostly Arabic (non-Emirati) nationalities. Third, in terms of delivery. Two of the universities offer gender-segregated education, which is fairly common in the UAE (El-Gohary *et al.*, 2016), while one combines male and female students in the same classes. Two out of three universities provided institutional approval and the third university accepted those approvals as sufficient for the project to comply with their standards for ethical research.

Each institution provided students enrolled in an entrepreneurship course as well as a comparison group of students (with a similar profile in terms of study program, age and gender) who enrolled in a different course during the same semester. One-third of the entrepreneurship and one-third of the other students were enrolled in a compulsory course. Only in one out of four entrepreneurship-comparison course combinations, entrepreneurship was an elective, while the comparison group was enrolled in a mandatory course. This is important, as self-selection (Storey, 2000) might considerably affect initial differences in EI between entrepreneurship and other students. In turn, these initial levels of EI might influence the change in EI that students experience during the course (Fayolle and Gailly, 2015). On final note regarding the nature of the sample, all included courses were taught by different instructors. While instructor behaviors may have a considerable impact on learning outcomes (Harrison, 2011), this factor is unlikely to influence results for this study due to several reasons. First, there is variability within both entrepreneurship and comparison group. Second, the analysis of results took place at the aggregate level. Third, a review of the literature did not reveal any empirical support for the notion that entrepreneurship instructors possess stronger teaching skills than other instructors.

The first measurement was taken at the start of the course and the second measurement was taken at the end of the course. All data were collected in the same semester, between January 2016 and June 2016. The total sample size is 246 of which 132 entrepreneurship students and 114 other students. Response reach were 74 per cent at the start versus 72 per cent at the end of the course (entrepreneurship students) and 66 per cent at the start versus 54 per cent at the end of the course (other students). In total, 169 females (average age: 22 years) and 90 males (average age: 23.5 years) participated. Table AI in the Appendix provides an overview of the included courses.

The questionnaire was designed and administered online in English. To explore content and face validity issues, a pilot study was conducted with seven non-native English speaking students from different Middle-Eastern and Asian nationalities at one of the participating universities. They were asked to fill it in and voice any doubts out loud, while one of the researchers was present and a few complicated phrases were simplified. These students did not participate in the actual study afterwards. Students were provided with class-time to participate, and it was explicitly stressed by their instructor that participation was anonymous, voluntary and non-graded. The data for this study were obtained from two parts of this survey: personal information (gender) and EI (7 items). EI refer to the self-perceived likelihood of becoming, or desire to become, an entrepreneur, somewhere in the future (Krueger *et al.*, 2000). The scale for EI can be found in the [Appendix](#) and is based on previous studies (Pruett *et al.*, 2009; Liñán *et al.*, 2011).

### 3.2 Measurement and reliability tests

A principal component analysis was applied on the main variable – EI – both at the start and at the end of the course. As [Table AII](#) in the [Appendix](#) demonstrates, the results indicate one factor with an eigenvalue greater than one. The KMO values (0.830 at the start and 0.894 at the end of the course) confirm that the data are suitable for factor analysis. The cumulative variance explained is 74.24 per cent. Furthermore, the Cronbach's alpha values for EI are within accepted parameters; at the start of the course (0.87) and at the end of the course (0.91).

### 3.3 Data analysis methods

Adhering to the ground rules for rigorous statistical analyses (Field, 2013), the data for EI are submitted to a test for normality of distribution. The Shapiro–Wilk test is the most appropriate one for small datasets (threshold is 2,000 individuals). The *p*-value for this test ([Table AIV](#)) indicates that the data might not be normally distributed. However, in conjunction with the results of the Skewness/Kurtosis test ([Table AV](#)) that are within the parameters accepted in social science and a visual inspection of the histogram ([Figure A1](#)), it may be concluded that data distribution is sufficiently normal. As such, the hypotheses can be tested by means of parametric tests. All three hypotheses are explored through independent samples *t*-test. In addition, the tests for the third hypothesis include a hierarchical multiple regression with change in EI as dependent variable and gender among the independent variables. The *p*-value for the Shapiro–Wilk test ([Table AVI](#)) and a visual inspection of the histogram ([Figure A2](#)) also confirm normal data distribution for change in EI.

The regression models include multiple possible predictors of EI. Some variables are chosen because of indications of importance from previous studies: EI at the start of the course (Fayolle and Gailly, 2015), whether a course is elective or mandatory (see Storey, 2000, on self-selection) and whether education is offered in a gender segregated setting or not (Cooney, 2009; Tynan *et al.*, 2009). Other variables are chosen in the function of potential moderators: university (the sample included three) and study level (undergraduate or postgraduate). Adding gender to the second model will clarify whether it accounts for a significant amount of variability in the change in EI, over and above the variability accounted for by other variables.

Several tests with these variables indicate that multi-collinearity is unlikely. Pearson's Bivariate Correlation test was applied on the main variables included in the *t*-tests ([Table AIII](#)) as well as on the variables included in the regression analysis ([Table AVII](#)). All correlations were weak to moderate, ranging between  $r = 0.15$  and  $r = 0.75$ . [Table AVIII](#),

with the coefficients of the regression, presents a tolerance that is higher than 0.1 and a variance inflation factor (VIF) value below 10. Table AIX displays a Durbin–Watson value of 2.29, which is between the two critical values of  $1 < d < 3$ .

Finally, the data passed two checks for homoscedasticity. The Normal Probability Plot (P-P) of the standardized regression residuals shows how points lie in a reasonably straight diagonal line from bottom left to top right (Figure A3), and the scatterplot of residuals versus predicted values displays an unclear pattern, a rectangular distribution with most of the scores concentrated in the center (Figure A4).

#### 4. Results

Table I demonstrates that, at the start of their course, the average score on EI of all male students combined (sum = 26.95) is higher than that of all female students combined (sum = 23.48). The *t*-test value is statistically significant ( $p = 0.000$ ), which means that *H1a* is supported.

Table II contains the same analyses for entrepreneurship students only. At the start of their entrepreneurship course, the average EI score for male students (sum = 24.53) is generally higher than for female entrepreneurship students (sum = 22.55). Again, the *t*-test value is statistically significant ( $p < 0.05$ ), which supports *H1b* as well.

As demonstrated in Table III, on average, students who participated in an entrepreneurship course have significantly ( $p < 0.05$ ) higher scores on EI (sum = 26.00) than students who did another course (sum = 23.93). While a similar difference was already visible at the start of the course (Table IV), the line indicating the increase in EI appears to be slightly more steep for entrepreneurship students than for other students (Figure 2). These results are in line with *H2*.

| Gender    | Sum   | <i>t</i> | Significance (2-tailed) |
|-----------|-------|----------|-------------------------|
| <i>EI</i> |       |          |                         |
| Male      | 26.95 | 4.813    | 0.000                   |
| Female    | 23.48 | 4.895    | 0.000                   |

**Note:** All students, start of the course

**Table I.**  
Gender and EI scores

| Group       | Gender | Sum   | <i>t</i> | Significance (2-tailed) |
|-------------|--------|-------|----------|-------------------------|
| EE students | Male   | 24.53 | 2.335    | 0.021                   |
|             | Female | 22.55 | 2.401    | 0.018                   |

**Note:** EI scores, start of the course

**Table II.**  
Gender and EI scores  
(start)

| Groups        | Sum     | <i>t</i> | Significance (2-tailed) |
|---------------|---------|----------|-------------------------|
| EE students   | 26.0092 | 2.333    | 0.021                   |
| Control group | 23.9375 | 2.318    | 0.022                   |

**Note:** EI scores (end of the course)

**Table III.**  
Course type and EI  
scores (end)

At the start of their course (Table II), female entrepreneurship students scored significantly lower on EI than their male counterparts. The line drawn between EI scores at the start and end of the course (Figure 3) appears to be steeper for female students. Table V demonstrates that the gender difference in EI has become insignificant at the end of the course ( $p > 0.05$ ). These results seem to indicate that entrepreneurship courses alleviate gender differences in EI, in line with the expectation. However, this hypothesis can be tested more rigorously through a regression analysis: comparing two models for predicting the change in EI – one without and one with gender in the equation. See “data analysis methods” in the previous section for a description of the composition of the models and the preliminary model tests.

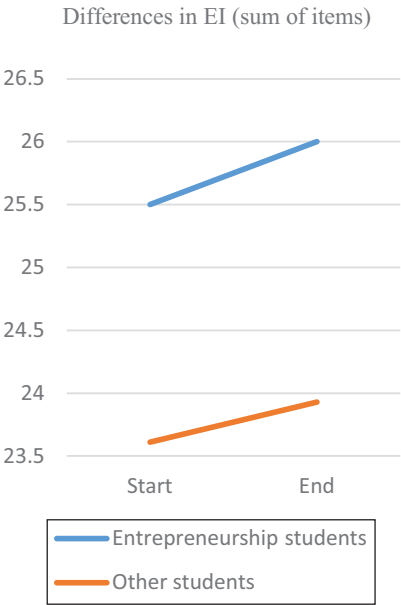
The first step of the hierarchical multiple regression included five independent variables, as mentioned earlier: EIstart (EI at the start of the course), university (our sample included three universities), study level (undergraduate versus postgraduate), gender segregation (course is offered to single sex versus mixed sections of students) and mandatory versus elective. Table VI shows that this model was statistically significant:  $F(5, 159) = 26.26$ ;  $p < 0.001$ , and that it explained 45 per cent of the variance in the change of EI. However, only EI at the start of the course and the study level made a significant unique contribution to the model (Table VII).

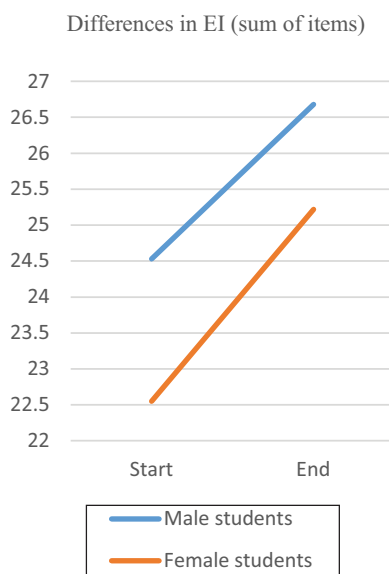
**Table IV.**  
Course type and EI  
scores (start)

| Groups        | Sum   | <i>t</i> | Significance (two-tailed) |
|---------------|-------|----------|---------------------------|
| EE students   | 25.50 | −2.688   | 0.008                     |
| Control group | 23.61 | −2.676   | 0.008                     |

**Note:** EI scores (start of the course)

**Figure 2.**  
EI scores and course  
type (descriptive)





**Figure 3.**  
EI scores and gender  
(descriptive)

| Group       | Gender | Sum     | <i>t</i> | Significance (2-tailed) |
|-------------|--------|---------|----------|-------------------------|
| EE students | Male   | 26.6780 | 1.363    | 0.176                   |
|             | Female | 25.2200 | 1.342    | 0.183                   |

**Table V.**  
Gender and EI scores  
(end)

**Note:** Entrepreneurship students, end of the course

| Models |            | Sum of squares | df  | Mean square | <i>F</i> | Significance       |
|--------|------------|----------------|-----|-------------|----------|--------------------|
| 1      | Regression | 4247.016       | 5   | 849.403     | 26.264   | 0.000 <sup>b</sup> |
|        | Residual   | 5142.232       | 159 | 32.341      |          |                    |
|        | Total      | 9389.248       | 164 |             |          |                    |
| 2      | Regression | 4580.231       | 6   | 763.372     | 25.081   | 0.000 <sup>c</sup> |
|        | Residual   | 4809.018       | 158 | 30.437      |          |                    |
|        | Total      | 9389.248       | 164 |             |          |                    |

**Notes:** <sup>a</sup>Dependent Variable: EIchange. <sup>b</sup>Predictors in model 1: (Constant) EIstart, University, Study level (UG-PG), Gender segregation, Elective-Mandatory. <sup>c</sup>Predictors in model 2: (Constant) EIstart, University, Study level (UG-PG), Gender segregation, Elective-Mandatory, Gender

**Table VI.**  
ANOVA<sup>a</sup>

After entry of gender at step two, the total variance explained by the model as a whole was 48 per cent. The ANOVA (Table VI) for this second model is also significant:  $F(6, 158) = 25.08$  with  $p < 0.001$ . As indicated by the value for  $\Delta R^2$  in Table VII, the introduction of gender explained additional 3.5 per cent of the variance in the change of EI, after controlling for the other variables. The negative regression weights for the significant impact of the gender variable imply that the change in EI is lower for male

**Table VII.**  
Hierarchical  
regression model of  
EI change

| Models |                    | R                  | R <sup>2</sup> | ΔR <sup>2</sup> | B      | SE    | β         | t       |
|--------|--------------------|--------------------|----------------|-----------------|--------|-------|-----------|---------|
| Step1  |                    | 0.673 <sup>a</sup> | 0.452***       |                 |        |       |           |         |
|        | EIstart            |                    |                |                 | -0.882 | 0.082 | -0.651*** | -10.798 |
|        | University         |                    |                |                 | -0.042 | 0.215 | -0.013    | -0.198  |
|        | Study level        |                    |                |                 | 2.758  | 1.169 | 0.152*    | 2.358   |
|        | Gender segregation |                    |                |                 | -1.667 | 1.558 | -0.109    | -1.070  |
| Step2  | Elective-Mandatory |                    |                |                 | -1.849 | 1.566 | -0.113    | -1.180  |
|        |                    | 0.698 <sup>b</sup> | 0.488***       | 0.035***        |        |       |           |         |
|        | EIstart            |                    |                |                 | -0.958 | 0.083 | -0.707*** | -11.612 |
|        | University         |                    |                |                 | -0.042 | 0.208 | -0.013    | -0.199  |
|        | Study level        |                    |                |                 | 2.668  | 1.135 | 0.148*    | 2.351   |
|        | Gender segregation |                    |                |                 | -2.525 | 1.533 | -0.164    | -1.646  |
|        | Elective-Mandatory |                    |                |                 | -1.599 | 1.521 | -0.097    | -1.051  |
|        | Gender             |                    |                |                 | -3.239 | 0.979 | -0.211*** | -3.309  |

**Notes:** Statistical significance: \* $p < 0.05$ ; \*\*\* $p < 0.001$

students than for female students. These results provide modest, tough not conclusive, support for the *H3*.

**5. Discussion and future research**

Negative gender stereotyping in entrepreneurship can be strong and very pervasive (Bird and Brush, 2002). Previous studies have highlighted how this cognition affects women’s EI and behavior in developing countries, such as India (Sharma, 2018) or Pakistan (Roomi *et al.*, 2018), as well as in developed countries, such as Finland (Joensuu *et al.*, 2013) or the USA (Shinnar *et al.*, 2014). The results for the first hypothesis indicate that United Arab Emirates form no exception to the rule, despite of the strong economic growth, rapidly modernizing society and clear efforts of the UAE Government supposed to stimulate female entrepreneurship. At the start of the semester, the average score for EI by female university students is significantly lower than the average score for EI by their male counterparts, whether they have enrolled in an entrepreneurship course. A combination of Krueger’s entrepreneurial model (Krueger *et al.*, 2000) with theory on gender stereotyping in entrepreneurship (Bird and Brush, 2002; Gupta *et al.*, 2009) provides a coherent theoretical explanation for these results, empirically supported by previous studies (Santos *et al.*, 2016). Summarized, female students have lower EI because they might consider entrepreneurship as less desirable and less feasible, due to gender stereotypes that shape their perception of social norms regarding appropriate career choices for women against entrepreneurship and that affect how they evaluate their own entrepreneurial skills.

Until EE is added to the equation [...] That is, the results for the second hypothesis indicate, modestly, that entrepreneurship courses in the UAE have a stronger positive impact on the EI of male and female students combined than other courses. This is in line with previous findings indicating a positive impact of EE on EI in other countries, such as France (Fayolle *et al.*, 2006). However, a recent meta-analysis found no significant impact of EE on EI at the aggregate level of previous empirical studies combined (Bae *et al.*, 2014), implying that EE does not always play this positive role. The conceptual framework presented in this study outlines why the effect of EE should not be assessed in isolation. Instead, its success is contingent to the contextual balance

of macro-social inhibitors and stimulants, such as those included in the literature review. In addition, the conceptual framework highlights how EE has the contradictory potential to either stimulate or inhibit EI, by mitigating or reinforcing gender stereotypes in entrepreneurship that are negative for women. This likely depends on moderating variables at the course level, such as course content and pedagogy (Harrison, 2011; Martin *et al.*, 2013). Future studies may provide more insights into how entrepreneurship courses in the UAE, and elsewhere, manage to alleviate existing gender stereotypes; qualitative techniques such as course content analysis and classroom observations would be appropriate methods to do so (Blenker *et al.*, 2014).

Most importantly, the results for *H3* indicate that EE in the UAE tips the balance of macro-social factors in favor of the stimulants of female students' EI. The significant difference between male entrepreneurship students' EI (higher) and female entrepreneurship students' EI (lower) at the start of their course has become insignificant at the end of their course. In addition, gender significantly explains a (small) part of the variance in EI, over and above the influence that multiple other variables have: male students are slightly less likely to experience change in their EI than female students. This implies that EE in the UAE might function as a discourse-altering experience (Byrne and Fayolle, 2010; Liñán *et al.*, 2011). Previous empirical studies have also established the effect of agency by female entrepreneurs in Muslim cultures, who actively re-interpret gender stereotypes in entrepreneurship and motivate their career choice in such a manner that it fits traditional gender social roles (Tlaiss, 2015; Roomi *et al.*, 2018). These two phenomena combined create a promising panorama for female entrepreneurship in this particular non-Western society. That said, the literature review also outlined how EE could reinforce male entrepreneurial stereotypes by emphasizing the importance of masculine behaviors or highlighting mostly male role models (Achtenhagen and Welter, 2011; Westhead and Solesvik, 2016). It appears that the entrepreneurship courses from this sample addressed the particular expectations and needs of these female students (Petridou *et al.*, 2009; Dhaliwal, 2010), creating an educational setting that is conducive for female entrepreneurship in the light of its particular socio-cultural structures and gender asymmetries (Roomi and Harrison, 2010). This might have been facilitated by the fact that most courses were offered in a female-only setting (Cooney, 2009; Tynan *et al.*, 2009), although this variable did not have a significant effect in the regression analysis. Further studies are needed to provide more conclusive evidence, though. Furthermore, how this might have been done, remains unclear. Did the courses provide appropriate female role models (Achtenhagen and Welter, 2011)? Was entrepreneurship presented in a way that would fit personality traits more often associated with women (Menzies and Tatoff, 2006)? Were topics and skills to be taught determined with the gender of students in mind (Petridou *et al.*, 2009)? The data set did not provide insights into these matters. In sum, future studies that combine quantitative pre-post measurements of EI and other related variables with qualitative data gathering techniques such as classroom observations and student focus groups, are needed to identify pivotal aspects contributing to the success of entrepreneurship courses in the UAE.

## 6. Conclusion, practical implications and limitations

The main research question of this study was:

- RQ1.* In the macro-social context of the UAE, will EE (EE) – more than other types of education – have a positive or negative effect on students' EI in general and on EI of female students in particular?

This exploration in an original and particularly interesting context was inspired by [Weeks \(2011\)](#) and based on a conceptual framework comprised of Krueger's model of EI ([Krueger et al., 2000](#)), theory of gender stereotypes in entrepreneurship ([Bird and Brush, 2002](#)) and previous empirical studies on the role of EE in reinforcing ([Achtenhagen and Welter, 2011](#)) or mitigating ([Liñán et al., 2011](#)) these stereotypes. On a side note, the literature review indicates the need for a comprehensive, structured study that outlines the effect of variability in sampling and methods on previous results of studies regarding the gendered impact of EE. The main findings demonstrate how in the UAE female students' EI is lower than that of their male counterparts, regardless of the course type. Furthermore, entrepreneurship courses appear to be more successful than other courses in raising the EI of students in general, and female students in particular. Finally, adding entrepreneurship to the equation of macro-social inhibitors and stimulants of female EI in the UAE, seemed to tip the balance in favor of the influence of economic affluence, rapid modernization and proactive governmental policies to stimulate the entrepreneurial spirit among female residents: at the end of the entrepreneurship courses, there was no significant gender difference in EI anymore. In addition, male students were found to be (slightly) less likely to experience change in their EI than female students. As is often the case, these findings generate new questions, and the paper outlines various opportunities for valuable future studies, preferably based on mixed methods.

In addition, the paper generates value through its practical implications. The UAE National Innovation Strategy was announced in 2014 and "strives to instill an entrepreneurial culture in schools and universities" ([Vision 2021, 2016](#)). In this sense, the findings provide empirical support, although modest, for the choice of UAE policymakers to rely on EE, among other means, for creating an environment that is conducive of (female) entrepreneurship. This might be an added incentive to stimulate all universities in the UAE to offer entrepreneurship courses to all students, regardless of their major. That said, most universities in the UAE continue to offer entrepreneurship courses on an elective basis ([Ashour, 2016](#)). In that case, universities should assess first to what extent their female students are inclined to register for these courses in comparison to their male counterparts, as previous studies are not univocal on that matter. On the one hand, Emirati female students were found to have very positive expectations of EE ([Gallant et al., 2010](#)). On the other hand, female students in our sample demonstrated significant lower EI than male students at the start of their course, possibly related to less interest in taking an entrepreneurship course, as was found in an empirical study in Canada ([Menzies and Tatoff, 2006](#)). Ensuring gender equality in reaping the benefits of EE, then, might require considerable effort to promote these courses among female students, for example, through proactive outreach by student advisors.

On a final note, the study contained some major limitations that should be emphasized. The most important one being the limited dataset that prevented the inclusion of previously found moderators of the impact of EE on EI at the course level (outlined in the discussion with suggestions for future research) as well as at the individual level, such as personality traits ([Zhao et al., 2010](#)), previous entrepreneurial experience ([Fayolle and Gailly, 2015](#)) or having parents who are entrepreneurs ([Laspita et al., 2012](#)). Furthermore, the study sample included only university students, implying that the findings may not be generalizable to the female population in the UAE at large. While EE might provide the trigger for female university students to consider starting up their own enterprise, this may still not be the case for all women in the UAE.

## References

- Achtenhagen, L. and Welter, F. (2011), "Surfing on the ironing board – the representation of women's entrepreneurship in German newspapers", *Entrepreneurship and Regional Development – An International Journal*, Vol. 23 Nos 9/10, pp. 763-786.
- Ahl, H. and Marlow, S. (2012), "Exploring the dynamics of gender, feminism and entrepreneurship: advancing debate to escape a dead end?", *Organization*, Vol. 19 No. 5, pp. 543-562.
- Ashour, S. (2016), "Social and business entrepreneurship as career options for university students in the United Arab Emirates: the drive-preparedness gap", *Cogent Education*, Vol. 3 No. 1, pp. 1-18.
- Bae, T.J., Qian, S., Miao, C. and Fiet, J.O. (2014), "The relationship between EE and EI: a meta-analytic review", *Entrepreneurship Theory and Practice*, Vol. 38 No. 2, pp. 217-254.
- Bird, B. and Brush, C.G. (2002), "A gendered perspective on organization creation", *Entrepreneurship Theory and Practice*, Vol. 26 No. 3, pp. 41-65.
- Blenker, P., Trolle Elmholt, S., Hedeboe Frederiksen, S., Korsgaard, S. and Wagner, K. (2014), "Methods in entrepreneurship education research: a review and integrative framework", *Education + Training*, Vol. 56 Nos 8/9, pp. 697-697.
- Byrne, J. and Fayolle, A. (2010), "A feminist enquiry into entrepreneurship training", in Smallbone, D., Leita, J., Raposo, M. and Welter, F. (Eds), *The Theory and Practice of Entrepreneurship*, Edward Elgar Publishing, Cheltenham, pp. 76-100.
- Cohen, L., Manion, L. and Morrison, K. (2011), *Research Methods in Education*, 7th ed., Routledge, New York, NY.
- Coleman, S. (2007), "The role of human and financial capital in the profitability and growth of women-owned small firms", *Journal of Small Business Management*, Vol. 45 No. 3, pp. 303-319.
- Cooney, T.M. (2009), "Developing entrepreneurship programmes for female members of the Irish traveler community", *International Journal of Gender and Entrepreneurship*, Vol. 1 No. 2, pp. 134-147.
- Dhaliwal, S. (2010), "Training women to win: a practical perspective on the training needs of women entrepreneurs", *International Journal of Gender and Entrepreneurship*, Vol. 2 No. 3, pp. 287-290.
- Dubai Statistics Center (2017), "Estimated population number by nationality", available at: [www.dsc.gov.ae/Report/Copy%20of%20DSC\\_SYB\\_2016\\_01%20-%202002.pdf](http://www.dsc.gov.ae/Report/Copy%20of%20DSC_SYB_2016_01%20-%202002.pdf) (accessed 15 May 2018).
- El-Gohary, H., Selim, H.M. and Eid, R. (2016), "Entrepreneurship education and employability of Arab HE business students: an attempt for a primary investigation", *International Journal of Business and Social Science*, Vol. 7 No. 4, pp. 52-72.
- El-Sokari, H., Van Horne, C., Zeng-Yu, H. and Al Awad, M. (2013), *Entrepreneurship: An Emirati Perspective*, The Institute for Social and Economic Research (ISER) - Zayed University, Dubai.
- van Ewijk, A.R. and Al-Aomar, R. (2016), "Inspiration, self-awareness and EI: a mixed method case study of postgraduate engineering students in the UAE", *Journal of EE*, Vol. 19 No. 1, pp. 103-126.
- Farrokhi, F. and Mahmoudi-Hamidabad, A. (2012), "Rethinking convenience sampling: defining quality criteria", *Theory and Practice in Language Studies*, Vol. 2 No. 4, pp. 784-792.
- Fayolle, A., Gailly, B. and Lassas-Clerc, N. (2006), "Assessing the impact of EE programmes: a new methodology", *Journal of European Industrial Training*, Vol. 30 No. 9, pp. 701-720.
- Fayolle, A. and Gailly, B. (2015), "The impact of EE on entrepreneurial attitudes and intention: hysteresis and persistence", *Journal of Small Business Management*, Vol. 53 No. 1, pp. 75-93.
- Field, A. (2013), *Discovering Statistics Using SPSS*, 4th ed., Sage, London.
- Gallant, M., Majumdar, S. and Varadarajan, D. (2010), "Outlook of female students towards entrepreneurship: an analysis of selection of business students in Dubai", *Education, Business and Society: Contemporary Middle Eastern Issues*, Vol. 3 No. 3, pp. 218-230.

- GEM (2018), "Global entrepreneurship monitor – 2017/2018 global report, global entrepreneurship research association (GERA)", available at: [www.gemconsortium.org/report](http://www.gemconsortium.org/report) (accessed 29 October 2018)
- Goby, V.P. and Eroglu, M.S. (2011), "Female entrepreneurship in the United Arab Emirates: legislative encouragements and cultural constraints", *Women's Studies International Forum*, Vol. 34 No. 4, pp. 329-334.
- Gupta, V.K., Turban, D.B., Wasti, S.A. and Sikdar, A. (2009), "The role of gender stereotypes in perceptions of entrepreneurs and intentions to become an entrepreneur", *Entrepreneurship Theory and Practice*, Vol. 33 No. 2, pp. 397-417.
- Gupta, V.K., Yayla, A.A., Sikdar, A. and Cha, M. (2012), "Institutional environment for entrepreneurship: evidence from the developmental states of South Korea and United Arab Emirates", *Journal of Developmental Entrepreneurship*, Vol. 17 No. 3, pp. 1-21.
- Harrison, J.L. (2011), "Instructor transformational leadership and student outcomes", *Emerging Leadership Journeys*, Vol. 4 No. 1, pp. 82-136.
- Iakovleva, T., Kolvareid, L. and Stephan, U. (2011), "Entrepreneurial intentions in developing and developed countries", *Education + Training*, Vol. 53 No. 5, pp. 353-370.
- Joensuu, A., Viljamaa, A. and Varamaki, E. (2013), "Development of entrepreneurial intention in higher education and the effect of gender – a latent growth curve analysis", *Education + Training*, Vol. 55 Nos 8/9, pp. 781-803.
- Krueger, N.F. and Brazeal, D.V. (1994), "Entrepreneurial potential and potential entrepreneurs", *Entrepreneurship Theory and Practice*, Vol. 18 No. 3, pp. 91-104.
- Krueger, N.F., Reilly, M. and Carsrud, A.L. (2000), "Competing models of entrepreneurial intentions", *Journal of Business Venturing*, Vol. 15 Nos 5/6, pp. 411-532.
- Laspita, S., Breugst, N., Heblich, S. and Patzelt, H. (2012), "Intergenerational transmission of entrepreneurial intentions", *Journal of Business Venturing*, Vol. 27 No. 4, pp. 414-435.
- Liñán, F., Rodríguez-Cohard, J.C. and Guzman, J. (2011), "Temporal stability of entrepreneurial intentions: a longitudinal study", in Borch, J., Fayolle, A., Kyro, P. and Ljunggren, E. (Eds), *Entrepreneurship Research in Europe: Evolving Concepts and Processes*, Edward Elgar, Cheltenham, pp. 34-55.
- Lucas, J.W. (2003), "Theory-testing, generalization, and the problem of external validity", *Sociological Theory*, Vol. 21 No. 3, pp. 236-253.
- Majumdar, S. and Varadarajan, D. (2013), "Students' attitude towards entrepreneurship: does gender matter in the UAE?", *Foresight*, Vol. 15 No. 4, pp. 278-293.
- Marlow, S. and McAdam, M. (2012), "Analyzing the influence of gender upon high-technology venturing within the context of business incubation", *Entrepreneurship Theory and Practice*, Vol. 36 No. 4, pp. 655-676.
- Martin, B.C., McNally, J.J. and Kay, M.J. (2013), "Examining the formation of human capital in entrepreneurship: a meta-analysis of EE outcomes", *Journal of Business Venturing*, Vol. 28 No. 2, pp. 211-224.
- Marlino, D. and Wilson, F. (2003), "Teen girls on business: are they being empowered to take courses and degree concentration in entrepreneurship", *Journal of Small Business and Entrepreneurship*, Vol. 19 No. 2, pp. 203-223.
- McGrath, R. and MacMillan, I. (1992), "More like each other than anyone else? A cross-cultural study of entrepreneurial perceptions", *Journal of Business Venturing*, Vol. 7 No. 5, pp. 419-429.
- Menzies, T.V. and Tatroff, H. (2006), "The propensity of male versus female students to take courses and degree concentration in entrepreneurship", *Journal of Small Business and Entrepreneurship*, Vol. 19 No. 2, pp. 203-213.
- Meyer, V., Tegtmeier, S. and Pakura, S. (2017), "Revisited: how gender role stereotypes affect the image of entrepreneurs among young adults", *International Journal of Gender and Entrepreneurship*, Vol. 9 No. 4, pp. 319-337.

- 
- MOHESR (2014), "The UAE higher education Factbook 2013-2014", available at: [www.mohesr.gov.ae/En/Services/Index/Documents/UAE-factbook24Feb-en-CDversion.pdf](http://www.mohesr.gov.ae/En/Services/Index/Documents/UAE-factbook24Feb-en-CDversion.pdf) (accessed 20 December 2016)
- Neergaard, H., Shaw, E. and Carter, S. (2005), "The impact of gender, social capital and networks on business ownership: a research agenda", *International Journal of Entrepreneurial Behavior and Research*, Vol. 11 No. 5, pp. 338-357.
- Patterson, N., Mavin, S. and Turner, J. (2012), "Envisioning female entrepreneur: leaders anew from a gender perspective", *Gender in Management: An International Journal*, Vol. 27 No. 6, pp. 395-416.
- Petridou, E., Sarri, A. and Kyrgidou, L.P. (2009), "Entrepreneurship education in higher educational institutions: the gender dimension", *Gender in Management: An International Journal*, Vol. 24 No. 4, pp. 286-309.
- Pruett, M., Shinnar, R.S., Toney, B., Llopis, F. and Fox, J. (2009), "Explaining entrepreneurial intention of university students: a cross-cultural study", *International Journal of Entrepreneurial Behavior and Research*, Vol. 15 No. 6, pp. 571-954.
- Rideout, E.C. and Gray, D.O. (2013), "Does EE really work? A review and methodological critique of the empirical literature on the effects of university-based EE", *Journal of Small Business Management*, Vol. 51 No. 3, pp. 329-351.
- Roomi, M.A. and Harrison, P. (2010), "Behind the veil: women-only entrepreneurship training in Pakistan", *International Journal of Gender and Entrepreneurship*, Vol. 2 No. 2, pp. 150-172.
- Roomi, M.A., Rehman, S. and Henry, C. (2018), "Exploring the normative context for women's entrepreneurship in Pakistan: a critical analysis", *International Journal of Gender and Entrepreneurship*, Vol. 10 No. 2, pp. 158-180.
- Rubery, J. (2002), "Gender mainstreaming and gender equality in the EU: the impact of the EU employment strategy", *Industrial Relations Journal*, Vol. 33 No. 5, pp. 500-522.
- Ryan, J.C., Tipu, S.A. and Zeffane, R.M. (2011), "Need for achievement and entrepreneurial potential: a study of young adults in the UAE", *Education, Business and Society: Contemporary Middle Eastern Issues*, Vol. 4 No. 3, pp. 153-166.
- Santos, F.J., Roomi, M.A. and Liñán, F. (2016), "About gender differences and the social environment in the development of EI", *Small Business Management*, Vol. 54 No. 1, pp. 49-66.
- Schein, V.E. (1973), "The relationship between sex role stereotypes and requisite management characteristics", *Journal of Applied Psychology*, Vol. 57 No. 2, pp. 95-100.
- Schein, V.E. and Davidson, M.J. (1993), "Think manager, think male – managerial sex typing among U. K. business students", *Management Development Review*, Vol. 6 No. 3, pp. 24-28.
- Schein, V.E. (2001), "A global look at psychological barriers to women's progress in management", *Journal of Social Issues*, Vol. 57 No. 4, pp. 675-688.
- Schlaegel, C. and Koenig, M. (2014), "Determinants of entrepreneurial intent: a meta-analytic test and integration of competing models", *Entrepreneurship Theory and Practice*, Vol. 38 No. 2, pp. 291-332.
- Sharma, L. (2018), "Entrepreneurial intentions and perceived barriers to entrepreneurship among youth in Uttarakhand state of India: a cross-cultural investigation across genders", *International Journal of Gender and Entrepreneurship*, Vol. 10 No. 3, pp. 243-269.
- Shinnar, R.S., Hsu, D.K. and Powell, B.C. (2014), "Self-efficacy, EI, and gender: assessing the impact of EE longitudinally", *The International Journal of Management Education*, Vol. 12 No. 3, pp. 561-570.
- Tlaiss, H.A. (2015), "Entrepreneurial motivations of women: evidence from the United Arab Emirates", *International Small Business Journal*, Vol. 33 No. 5, pp. 562-581.
- Tynan, M., Thomas, D., Durand, M., O'Gorman, B. and Fuller-Love, N. (2009), "Training female entrepreneurs: a two country comparison", *International Journal of Gender and Entrepreneurship*, Vol. 1 No. 3, pp. 253-260.

- Thornton, P.H., Ribeiro-Soriano, D. and Urbano, D. (2011), "Socio-cultural factors and entrepreneurial activity: an overview", *International Small Business Journal*, Vol. 29 No. 2, pp. 105-118.
- Verheul, I., van Stel, A. and Thurik, R. (2006), "Explaining female and male entrepreneurship at the country level", *Entrepreneurship and Regional Development*, Vol. 18 No. 2, pp. 151-183.
- Vision 2021 (2016), "Government vision for the future of the United Arab Emirates", available at: [www.vision2021.ae/en/national-priority-areas/competitive-knowledge-economy](http://www.vision2021.ae/en/national-priority-areas/competitive-knowledge-economy) (accessed 12 December 2016)
- Weeks, J.R. (2011), "Assessing Business Enabling Environments: how gender changes the equation", Paper presented at the 55th annual world conference of the International Council for Small Business, 16 June, Stockholm, available at: [www.womenable.com/content/userfiles/Weeks\\_Engendering\\_BEE\\_public.pdf](http://www.womenable.com/content/userfiles/Weeks_Engendering_BEE_public.pdf) (accessed 21 May 2018).
- Westhead, P. and Solesvik, M.Z. (2016), "Entrepreneurial education and entrepreneurial intention: do female students benefit?", *International Small Business Journal*, Vol. 34 No. 8, pp. 979-1003.
- Wilson, F., Marlino, D. and Kickul, J. (2004), "Our entrepreneurial future: examining the diverse attitudes and motivations of teens across gender and ethnic identity", *Journal of Developmental Entrepreneurship*, Vol. 9 No. 3, pp. 177-197.
- Wilson, F., Kickul, J. and Marlino, D. (2007), "Gender, entrepreneurial self-efficacy, and entrepreneurial career intentions: implications for EE", *Entrepreneurship Theory and Practice*, Vol. 31 No. 3, pp. 387-406.
- World Population Review (2018), "United Arab Emirates population 2018", available at: <http://worldpopulationreview.com/countries/united-arab-emirates-population/> (accessed 30 May 2018)
- Wu, Z. and Chua, J.H. (2012), "Second-order gender effects: the case of US small business borrowing cost", *Entrepreneurship Theory and Practice*, Vol. 36 No. 3, pp. 443-463.
- Xu, H., Zhan, H.J., James, C.E.E., Fannin, L.D. and Yin, Y. (2018), "Double bind in loan access in China: the reification of gender differences in business loans", *International Journal of Gender and Entrepreneurship*, Vol. 10 No. 3, pp. 182-197.
- Zhao, H., Seibert, S. and Lumpkin, G.T. (2010), "The relationship of personality to entrepreneurial intentions and performance: a meta-analytic review", *Journal of Management*, Vol. 36 No. 2, pp. 381-404.

### Further reading

- Thurik, R. and Wennekers, S. (2004), "Entrepreneurship, small business and economic growth", *Journal of Small Business and Enterprise Development*, Vol. 11 No. 1, pp. 140-149.

### Corresponding author

Anne Rienke van Ewijk can be contacted at: [Anne.ewijk@adu.ac.ae](mailto:Anne.ewijk@adu.ac.ae)

## Appendix

Context,  
gender and  
entrepreneurial  
intentions

| Institution | College     | Course name (c = comparison group)                                                      | Level | Elective/<br>Mandatory | Male/<br>Female ratio |
|-------------|-------------|-----------------------------------------------------------------------------------------|-------|------------------------|-----------------------|
| Private 1   | Business    | Entrepreneurship Management/1 male, 1 female section                                    | UG    | Elective               | 3/15                  |
| Private 1   | Business    | Special Topics in Management - Innovation and Entrepreneurship/1 male, 1 female section | UG    | Elective               | 6/12                  |
| Private 1   | Business    | Strategic Management (c)/1 male, 1 female section                                       | UG    | Mandatory              | 9/13                  |
| Private 1   | Engineering | Innovation and Entrepreneurship/1 mixed section                                         | PG    | Elective               | 8/8                   |
| Private 1   | Engineering | Risk Management for Systems Engineers (c)/1 mixed section                               | PG    | Elective               | 7/9                   |
| Private 2   | Engineering | Entrepreneurship/1 mixed section                                                        | UG    | Elective               | 18/15                 |
| Private 2   | Engineering | Principles of Marketing for Engineers (c)/1 mixed section                               | UG    | Elective               | 20/14                 |
| Public      | Business    | Innovation and Entrepreneurship/1 male, 2 female sections                               | UG    | Mandatory              | 16/31                 |
| Public      | Business    | Business Statistics for Managers (c)/2 female sections                                  | UG    | Mandatory              | 0/42                  |
|             |             |                                                                                         |       |                        | 87/159                |

**Note:** Total:  $N = 246$

**Table AI.**  
Additional sample  
details

| Entrepreneurial intentions (EI)                                                             | Component start<br>course* End<br>course** |       |
|---------------------------------------------------------------------------------------------|--------------------------------------------|-------|
| a. My professional goal is to become an entrepreneur                                        | 0.837                                      | 0.883 |
| b. I prefer to be employed in an organization and not be an entrepreneur (*)                | 0.594                                      | 0.612 |
| c. Being an entrepreneur would give me great satisfaction                                   | 0.829                                      | 0.874 |
| d. A career as an entrepreneur is totally attractive to me                                  | 0.504                                      | 0.676 |
| e. I am very seriously thinking of starting my own venture or business                      | 0.877                                      | 0.884 |
| f. If I had the opportunity and resources, I would love to start my own venture or business | 0.812                                      | 0.792 |
| g. I am ready to do anything to become an entrepreneur                                      | 0.813                                      | 0.874 |

**Notes:** Extraction method: Principal Component Analysis. Rotation method: Varimax with Kaiser Normalization. Rotation converged in three iterations. \* KMO (EI, start course) = 0.830- Barlett's test (EI) sig. < 0.000. \*\* KMO (EI, end course) = 0.894- Barlett's test (EI) sig. < 0.000

**Table AII.**  
Rotated component  
matrix

IJGE  
11,1

94

**Table AIII.**  
Correlation matrix:  
main variables for  
*t*-tests

|                                                                                                                                    |                     |          | Elstart | Course type | Gender |
|------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------|---------|-------------|--------|
| El at the start of the course                                                                                                      | Pearson correlation | 1        |         |             |        |
|                                                                                                                                    | Sig. (2-tailed)     |          |         |             |        |
| Course type (entr. vs other)                                                                                                       | Pearson correlation | 0.163*   |         | 1           |        |
|                                                                                                                                    | Sig. (2-tailed)     | 0.014    |         |             |        |
| Gender                                                                                                                             | Pearson correlation | −0.314** |         | −0.252**    | 1      |
|                                                                                                                                    | Sig. (2-tailed)     | 0.000    |         | 0.000       |        |
|                                                                                                                                    |                     |          | Elend   | Course type | Gender |
| El at the end of the course                                                                                                        | Pearson correlation | 1        |         |             |        |
|                                                                                                                                    | Sig. (2-tailed)     |          |         |             |        |
| Course type (entr. vs other)                                                                                                       | Pearson correlation | 0.176*   |         | 1           |        |
|                                                                                                                                    | Sig. (2-tailed)     | 0.021    |         |             |        |
| Gender                                                                                                                             | Pearson correlation | −0.271** |         | −0.272**    | 1      |
|                                                                                                                                    | Sig. (2-tailed)     | 0.000    |         | 0.000       |        |
| <b>Notes:</b> **Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed) |                     |          |         |             |        |

**Table AIV.**  
Data normality  
(Elstart and Elend)

|                                 | Statistic | Shapiro–Wilk<br>df | Significance |
|---------------------------------|-----------|--------------------|--------------|
| El at start                     | 0.976     | 246                | 0.000        |
| El at end                       | 0.977     | 173                | 0.006        |
| <b>Note:</b> Shapiro–Wilk tests |           |                    |              |

**Table AV.**  
Data normality  
(Elstart and Elend)

|                                       | Statistic | Skewness<br>Std. Error | Statistic | Kurtosis<br>Std. Error |
|---------------------------------------|-----------|------------------------|-----------|------------------------|
| El at start                           | −0.200    | 0.155                  | 0.092     | 0.309                  |
| El at end                             | −0.202    | 0.185                  | −0.425    | 0.367                  |
| <b>Note:</b> Skewness/kurtosis values |           |                        |           |                        |

**Table AVI.**  
Data normality  
(Elchange)

|                                | Statistic | Shapiro–Wilk<br>df | Significance |
|--------------------------------|-----------|--------------------|--------------|
| Elchange                       | 0.995     | 165                | 0.876        |
| <b>Note:</b> Shapiro–Wilk test |           |                    |              |

|                     | Elchange | University | Gender   | Elect.-Mandat. | Level   | Gend.segr. | Elstart | Context,<br>gender and<br>entrepreneurial<br>intentions |
|---------------------|----------|------------|----------|----------------|---------|------------|---------|---------------------------------------------------------|
| Elchange            | 1        |            |          |                |         |            |         |                                                         |
| University          | 0.000    | 1          |          |                |         |            |         |                                                         |
| Gender              | 0.026    | 0.000      | 1        |                |         |            |         |                                                         |
| Elective-Mandatory  | 0.036    | 0.120      | 0.314**  | 1              |         |            |         |                                                         |
| Study level (UG-PG) | 0.149    | -0.179*    | -0.106   | -0.162*        | 1       |            |         |                                                         |
| Gender segregation  | -0.084   | 0.149      | -0.370** | -0.745**       | 0.293** | 1          |         |                                                         |
| Elstart             | -0.652** | -0.107     | -0.316** | -0.145         | -0.012  | 0.158*     | 1       |                                                         |

**Notes:** Variables for regression analysis; \*\*correlation is significant at the 0.01 level (2-tailed); \*Correlation is significant at the 0.05 level (2-tailed)

**Table AVII.**  
Correlation matrix

| Model               | Unstandardized coefficients |            | Standardized coefficients<br>Beta | <i>t</i> | Significance | Collinearity statistics |       |
|---------------------|-----------------------------|------------|-----------------------------------|----------|--------------|-------------------------|-------|
|                     | B                           | Std. Error |                                   |          |              | Tolerance               | VIF   |
| 1(Constant)         | 23.363                      | 2.547      |                                   | 9.172    | 0.000        |                         |       |
| Elstart             | -0.882                      | 0.082      | -0.651                            | -10.798  | 0.000        | 0.948                   | 1.055 |
| University          | -0.042                      | 0.215      | -0.013                            | -0.198   | 0.844        | 0.772                   | 1.296 |
| Study level (UG-PG) | 2.758                       | 1.169      | 0.152                             | 2.358    | 0.020        | 0.824                   | 1.213 |
| Gender segregation  | -1.667                      | 1.558      | -0.109                            | -1.070   | 0.286        | 0.335                   | 2.986 |
| Elective-Mandatory  | -1.849                      | 1.566      | -0.113                            | -1.180   | 0.240        | 0.378                   | 2.644 |
| 2(Constant)         | 27.597                      | 2.783      |                                   | 9.917    | 0.000        |                         |       |
| Elstart             | -0.958                      | 0.083      | -0.707                            | -11.612  | 0.000        | 0.875                   | 1.142 |
| University          | -0.042                      | 0.208      | -0.013                            | -0.199   | 0.842        | 0.772                   | 1.296 |
| Study level (UG-PG) | 2.668                       | 1.135      | 0.148                             | 2.351    | 0.020        | 0.824                   | 1.214 |
| Gender segregation  | -2.525                      | 1.533      | -0.164                            | -1.646   | 0.102        | 0.325                   | 3.074 |
| Elective-Mandatory  | -1.599                      | 1.521      | -0.097                            | -1.051   | 0.295        | 0.377                   | 2.650 |
| Gender              | -3.239                      | 0.979      | -0.211                            | -3.309   | 0.001        | 0.795                   | 1.258 |

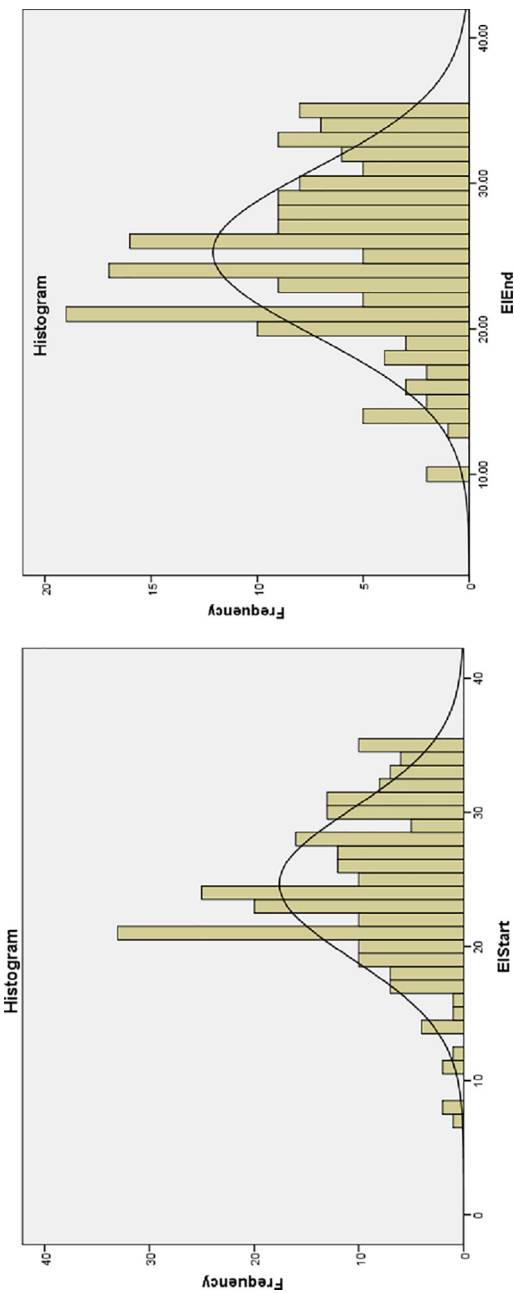
**Note:** <sup>a</sup> Dependent Variable: ElChange

**Table AVIII.**  
Coefficients for regression analysis<sup>a</sup>

| Model | R      | <i>R</i> square | Adjusted <i>R</i> square | Std. error of the estimate | <i>R</i> square change | Change statistics |                 |                 | Sig. <i>F</i> change | Durbin-Watson |
|-------|--------|-----------------|--------------------------|----------------------------|------------------------|-------------------|-----------------|-----------------|----------------------|---------------|
|       |        |                 |                          |                            |                        | <i>F</i> change   | df <sup>1</sup> | df <sup>2</sup> |                      |               |
| 1     | 0.673a | 0.452           | 0.435                    | 5.68692                    | 0.452                  | 26.264            | 5               | 159             | 0.000                |               |
| 2     | 0.698b | 0.488           | 0.468                    | 5.51696                    | 0.035                  | 10.948            | 1               | 158             | 0.001                | 2.290         |

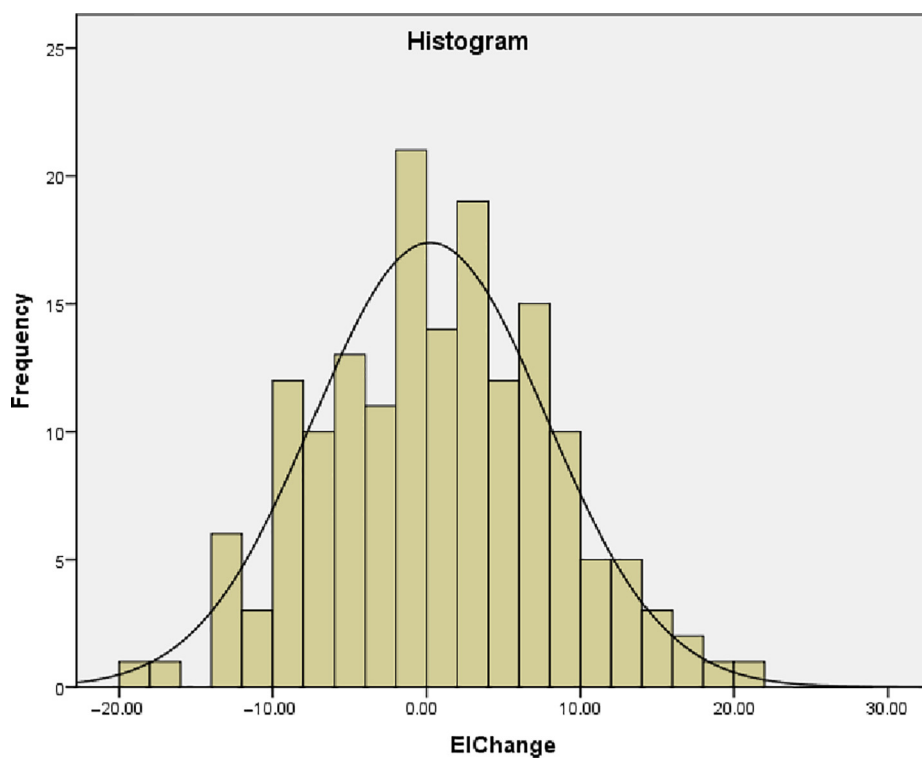
**Notes:** <sup>a</sup> Predictors: (Constant) Elstart, University, Study level (UG-PG), Gender segregation, Elective-Mandatory; <sup>b</sup> Predictors: (Constant) Elstart, University, Study level (UG-PG), Gender segregation, Elective-Mandatory, Gender; <sup>c</sup> Dependent Variable: Elchange

**Table AIX.**  
Regression model summary<sup>c</sup>



**Note:** Histogram with plotted normal curve (SPSS output)

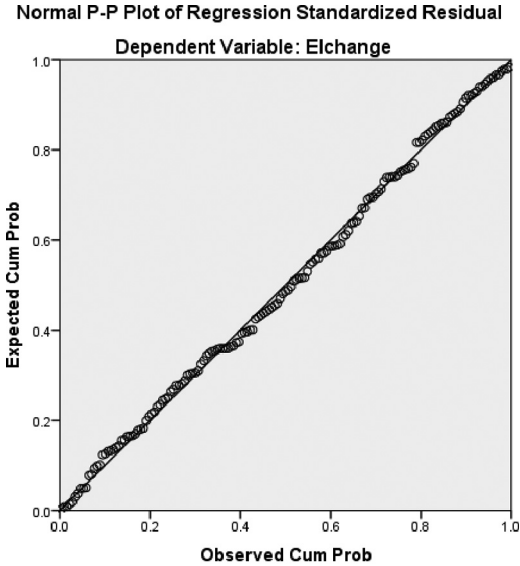
**Figure A1.**  
Data normality  
(EIstart and EIend)



**Note:** Histogram with plotted normal curve (SPSS output)

**Figure A2.**  
Data normality (EI  
change)

Figure A3.  
Data normality (EI  
change)



Note: P-Plot of residuals (SPSS output)

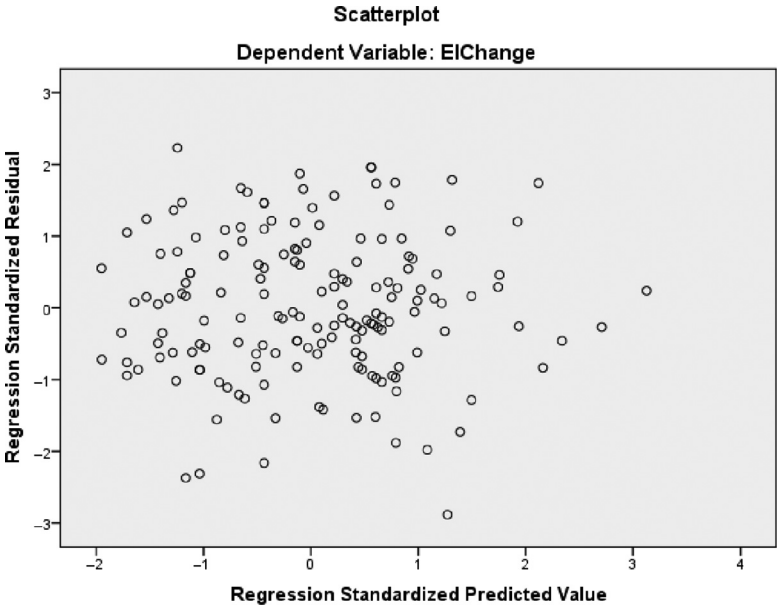


Figure A4.  
Data normality (EI  
change)

Note: Scatterplot of residuals (SPSS output)