The effect of entrepreneurship ecosystem on the entrepreneurial skills of agriculture students: The mediating role of social intelligence and emotional intelligence (The case of University of Zabol, Iran)

Hamid Karimi1 · Pouria Ataei2

Accepted: 11 July 2022 / Published online: 15 July 2022 © The Author(s), under exclusive licence to Springer Science+Business Media, LLC, part of Springer Nature 2022, corrected publication 2023

Abstract
The present research aimed to analyze the effects of different dimensions of the entrepreneurship ecosystem on the agricultural students’ entrepreneurial skills mediated by social and emotional intelligence. The research was conducted among the agricultural students at University of Zabol ($N=893$) of whom 269 students were sampled by the stratified randomization technique with proportional allocation. The measurement instrument was a questionnaire whose validity was confirmed by a panel of entrepreneurship experts and its reliability was determined by calculating the ordinal coefficient theta (0.81–0.92) in a pilot study. The results showed that the indicators used to measure the research variables were consistent with the factor structure and theoretical framework of the research. The entrepreneurship ecosystem was found to have a positive and significant effect on the students’ social intelligence and emotional intelligence. Also, the students’ entrepreneurial skills were found to be influenced by the entrepreneurship ecosystem, social intelligence, and emotional intelligence positively and significantly. It can be concluded that higher social and emotional intelligence in students and the improvement of the entrepreneurship ecosystem can provide the conditions for the students to acquire and reinforce entrepreneurial skills.

Keywords Agriculture students · Entrepreneurial skills · Entrepreneurial training · Entrepreneurship ecosystem · Social and emotional intelligence

Introduction
Despite extensive endeavors on the development of entrepreneurship in recent years, entrepreneurship and small and medium-sized enterprises (SMEs) have not developed adequately and sustainably in Iran. Many entrepreneurs in Iran are faced with such barriers as changing policies of the government, the arbitrary adoption of policies, unhealthy business environment, instability of governmental managers and employees, inappropriate and non-supportive regulations, lack of environmental confidence, lack of commercial infrastructure, inappropriate market, the high interest rate of bank loans, and so on, which have created an adverse business environment for them (Fallah Haghighi et al., 2018a; Mohammadi Elyasi & Notash, 2012; Moradi et al., 2012). Consequently, most students and graduates are reluctant to launch their own businesses, or those who engage in entrepreneurial activities stop or abandon them incomplete. On the other hand, to move towards development, society and universities should lay the required ground for the students to be equipped with entrepreneurial knowledge and skills so that the students can use these capabilities to channelize other resources of the society towards value creation and growth and development (Ataei et al., 2020; Fallah Haghighi & Bijani, 2016; Fallah Haghighi et al., 2018b). The World Bank reported in 2015 that the difficulty of business initiation in Iran has been aggravated in recent years. In this respect, it was ranked 120 among 191 countries by the Central Bank of Iran in 2017, downgraded by two ranks versus the preceding year.
Given the extensive progress of other nations, Iran’s rank decreased from 167 to 170 in transboundary trade in 2017. The Global Competitiveness Report 2016/2017 published by the Global Economic Forum ranks Iran 124th in ease of access to loans and 110th in venture capital availability among 138 countries (Mansuri et al., 2017). Most countries have concluded that they need to foster a competitive and dynamic entrepreneurial economy, but they have mostly failed to proceed towards such an economy due to the lack of an entrepreneurial ecosystem, unclear policies on entrepreneurship, and lack of knowledge as to how to respond to the emergence of entrepreneurial society (Tsai & Kuo, 2011). Since the sectoral policies have proven to be inefficient in developing entrepreneurship, it seems necessary to have an ecosystem-oriented approach with an intermingled relationship of its elements (Nadgrodkiewicz, 2013). On the other hand, researchers state that the lack of entrepreneurial skills is a major challenge of entrepreneurship development (Hosseininia et al., 2017; Parvin et al., 2012) whereas disproportion of educational content with the needs of the labor market, inattention to entrepreneurship training, and poor entrepreneurial skills of college students are among the key reasons for their unemployment after graduation (Hosseini & Yaqoubi, 2005; Khayri et al., 2011). Also, some scholars argue that the two psychological components of social intelligence and emotional intelligence contribute to the entrepreneurial process (Agha Ahmadi et al., 2012; Bar-On, 1997; Pradhan & Nath, 2012; Tabatabaei et al., 2015). People with higher social intelligence and emotional intelligence are more likely to be an entrepreneur because they can cope with negative and vexing emotions and the stress caused by the work and environment during launching and managing a new business (Kong & Zhao, 2013). These people usually analyze and interpret issues positively, identify opportunities, and are very optimistic about the prospect and viability of the new business (Baron, 2008). Social intelligence is connected with entrepreneurial behavior and activities as it represents the ability to compromise with others, the consciousness of social issues, and the capability of inter-personal communications and cooperation (Moradi-Pordanjani & Sadeghi-Dehgheshmeh, 2014).

Accordingly, the present research aimed to shed light on the impact of the entrepreneurial ecosystem on the entrepreneurial skills of agriculture students mediated by social and emotional intelligence. The objectives were to expand previous research, study what factors have more impact on students’ entrepreneurial skills, and uncover unexplored interactions between the entrepreneurship ecosystem and emotional and social intelligence. Moreover, the study aimed to investigate students’ perceptions of the entrepreneurship system, and their impact on their self-reported entrepreneurial skills.

**Entrepreneurial ecosystem**

Entrepreneurship development requires a network of different elements – this network is called the entrepreneurship ecosystem. Entrepreneurship ecosystem refers to elements, individuals, organizations, or institutions that can stimulate individuals or inhibit them from becoming an entrepreneur. This ecosystem encompasses a plethora of components categorized in six primary domains including market, policy, financial capital, culture, support, and human capital (Isenberg, 2011). The entrepreneurship ecosystem emerged as a basis for designing entrepreneurship policies, especially for technology-oriented start-ups. Research on the entrepreneurship ecosystem focuses on the close relationships of people, government, and relevant agencies and other effective factors for the support of entrepreneurial activities defined in a certain geographical region. This ecosystem may be formed at the regional, national, or even university level (Malecki, 2011; Mason & Brown, 2014; Theodotou, 2012). Isenberg (2011) suggests that an ecosystem plays a critical role in economic development. Accordingly, universities are linked with the entrepreneurship ecosystem at two levels. The first level is their presence as a part of the regional entrepreneurship ecosystem and the second is the entrepreneurship ecosystem inside the university itself. Concerning the entrepreneurship ecosystem inside a university, factors like desirable educational climate, management and leadership style, and appropriate infrastructure including training courses can be effective in fostering potentially entrepreneur students (Miller & Acs, 2017). Entrepreneurship ecosystems are quickly turning into a general instrument in the studies on entrepreneurship geography. Ecosystems are a group of concentrated cultural perspectives, social networks, financial support, universities, and active economic policies that create a supportive environment for innovation-based ventures.

In a study on the content of the policies in Iran and its consistency with the dimension of entrepreneurship ecosystems, Ghambaral et al. (2016) reveal that the national macro policies, e.g. the Constitution, the 1404 Perspective Document and its policies, and the policies in Development Action Plans, are supportive of entrepreneurship. The trend of considering entrepreneurship has been almost ascending in the 2nd and 4th action plans and descending in the 3rd and 5th plans, implying the fading attention to entrepreneurship ecosystem dimensions in the mindset of policymakers. Entezari (2018) shows that the free economy and effective political environment are the key components of an innovative entrepreneurship ecosystem in Iran and they constitute the basis for the formation of
the other components of the ecosystem. Based on the studies of Regele and Neck (2012) and Suresh and Ramraj (2012), an entrepreneurship ecosystem is, by nature, the result of the interaction between people, roles, organizations, infrastructure, and events that create an environment apt for the enhancement of entrepreneurial activities. This ecosystem is composed of components like access to capital, entrepreneurship training, the presence of government-oriented entrepreneurship plans, research and development, commercial and legal policies and infrastructure, and easy regulations to enter a job. It plays a role in the creation and development of entrepreneurship through ethical, financial, technological, market, social, network, governmental, and environmental supports.

**Entrepreneurial skills**

People at all levels need entrepreneurial skills to enable them to improve their ability to face current changes in life and future uncertainties (Sajadi Qeidari et al., 2017; Yaghoubi Farani et al., 2019) because entrepreneurial skills are necessary for developing innovations in production and service and extending solutions for need formation in the market (Imani Jajromi et al., 2012). Mousivand et al. (2017), Tripathy (2019), Reyad et al. (2019), Ismail et al. (2019), and Woodcock et al. (2019) suggest that the success of entrepreneurs strongly depends on their business skills and entrepreneurial educations. In this respect, they assert that universities must develop different plans to promote entrepreneurship among their graduates because the young generation needs to know how to act in complicated environments with changing regulations in the labor market.

According to Khosravi et al. (2014) and Mardanshahi et al. (2015), the status of entrepreneurial skills among the students in Iran is unsatisfactory and lower than the average. Another research on the entrepreneurial skills for the labor market in the higher educational content shows that the present programs in universities teach entrepreneurial skills to the students at an average to a low level (Salehi Emran & Yaghmouri, 2010). The prerequisite for entrepreneurship is to acquire different skills such as the ability of planning, the appropriate exploitation of opportunities, negotiation skills, marketing, motivating, and so on (De Araujo et al., 2020). Safari and Samiazadeh (2012) conclude that students need to acquire such skills as the principle of business, business design, communication, management and organization, legal and commercial regulations, accounting, business establishment, marketing, strategic management, and international business. Zarei Sebhati et al. (2016) and Dizji and Zini (2018) also studied entrepreneurial skills in the context of personal, managerial, and technical skills. Kashani et al. (2017) enumerated the skills of business launching, working with the Internet and computer, familiarity with labor and commercial rules and regulations, team-working, planning and goal-setting, opportunity recognition, and financial affairs. Likewise, Hosseininia et al. (2017) listed six entrepreneurial skills to include the knowledge of the business plan, communication, familiarity with legal and commercial rules and regulations, planning, team-building, and marketing.

**Social intelligence**

Social intelligence refers to the ability to understand and manage others and display wise behavior in interaction with others (Frankovsky & Birknerová, 2014). Some components of social intelligence include perceptual, analytical-cognitive, and behavioral components (Björkqvist, 2000). This can be perceived as the ability to understand and rein one’s emotions and feelings to help intellectual activities, decision-making, and communication. Based on the findings of Alizade Aghdam et al. (2016), people with higher emotional intelligence know how to control and direct their own emotions and feelings and those of others.

Agha Ahmadi et al. (2012) found a positive and significant relationship between the students’ entrepreneurial skill and their social intelligence so that social intelligence and its components could predict their entrepreneurial skills. In a study on the relationship of social intelligence with entrepreneurial skills and creativity of students, Tabatabaei et al. (2015) concluded that social intelligence and its dimensions were related to the students’ entrepreneurial skills positively and significantly. Moradi Pardanjani et al. (2015), who addressed the effect of social intelligence on social entrepreneurship, concluded that people’s possession of the dimensions and components of social intelligence and social entrepreneurship was higher than the average and there was a significant relationship between all components of social intelligence and social entrepreneurship. Alizade Aghdam et al. (2016) revealed a significant relationship between students’ social intelligence and their entrepreneurial capability.

**Emotional intelligence**

In addition to social intelligence, an inherent and psychological attribute that affects the entrepreneurship process is emotional intelligence (Bar-On, 1997), which reflects the ability to recognize a person’s own emotions and those of others to stimulate and manage one’s emotions and relations (Bardzil & Slaski, 2003). Extensive studies have revealed a positive relationship between emotional intelligence and entrepreneurial attitude (Pradhan & Nath, 2012; Zampetakis et al., 2012). Emotional intelligence has also been found to influence the entrepreneurship process (Ahmetoglu et al., 2011; FakhrEldin, 2017; Morton et al., 2014). Zampetakis et al. (2012) found a positive relationship between emotional
intelligence and attitude towards entrepreneurship and an indirect relationship between emotional intelligence and entrepreneurial intention of the students. Karimi (2016) and Ahmadi Kafeshani and Nazemi (2014) found that the dimensions of emotional intelligence were related to the attitude, subjective norms, and entrepreneurial intention of the students. Rezaei (2017) reported a significant relationship between emotional intelligence and the entrepreneurial abilities of the students. In a study on the emotional intelligence of entrepreneurs, Rhee and White (2007) revealed that successful entrepreneurs had a high level of such factors as team-working, self-reliance, stress management, and self-confidence, which should be considered in developing emotional intelligence. In a study entitled ‘Emotional intelligence: The secret of successful entrepreneurs’, Boren (2010) concluded that entrepreneurs with higher emotional intelligence would be more successful in entrepreneurship and the development of innovative businesses. In an attempt to find a relationship between emotional intelligence and successful entrepreneurs, McLaughlin (2012) detected higher emotional intelligence in entrepreneurs.

A review of the literature showed that the entrepreneurial skills of people can be enhanced by several factors. It can be said that to reinforce and develop entrepreneurial skills, an entrepreneurship ecosystem should be formed. In other words, the components of an entrepreneurship ecosystem, such as human capital, markets, finance, supports, culture, and policy, should influence people’s entrepreneurial skills. On the other hand, there are some psychological elements that can affect the development of a business and entrepreneurial skills. Previous research has proven that factors like social intelligence and emotional intelligence can affect this process – the former through social awareness, social skills, and social information process and the latter through the components of adaptability, mood, stress management, interpersonal skills, and intra-personal skills. Accordingly, the conceptual framework of the research was developed as depicted in Fig. 1.

**Methodology**

The present research is a quantitative study of the descriptive-correlational type in terms of data collection methodology and generalizability. It was conducted by the survey technique. The research population was composed of the agriculture students at University of Zabol amounting to 893 people. The sample was taken by the stratified randomization technique with proportional allocation. The sample size was determined to be 269 individuals by Krejcie and Morgan’s (1970) table. For this purpose, the students were divided into 13 departments. Since the departments had different numbers of students, their sample sizes were determined in proportion to their size. The data collection instrument was a questionnaire administered and completed in face-to-face interviews. At the final stage of data collection, a total of 269 questionnaires were distributed, out of which 269 were returned (with a return rate of 100%). The interviewer informed the students before starting the survey that their answers would be anonymized. They may, at any time, withdraw their participation, including the withdrawal of any information they have provided. If they completed the interview, however, it would imply that they had consented to participate in this research and agreed to the publication of the overall results of this research with the understanding that anonymity

![Fig. 1 The conceptual framework of the research](image-url)
of the interviewees would be taken into account. The dimensions of entrepreneurship ecosystem (human capital, markets, finance, supports, culture, and policy) were assessed by Isenberg’s (2011) standard questionnaire, the dimensions of emotional intelligence (adaptability, mood, stress management, inter-personal skills, and intra-personal skills) were assessed by Bar-On’s (1997) standard questionnaire, the dimensions of social intelligence (social awareness, social skills, and social information processing) were assessed by the Tromsø standard questionnaire (Silver et al., 2001), and the students’ entrepreneurial skills were assessed by a self-designed questionnaire. The face validity of the questionnaire was confirmed by a panel of entrepreneurial experts. To check its reliability, 30 questionnaires were filled by individuals outside the statistical population in a pilot study, and the ordinal coefficient theta was calculated. The scales used in this study were adapted based on the study population (students). The scales of Bar-On’s standard questionnaires were adapted based on the study population (students). The scales of Tromsø and Isenberg’s standard questionnaires were adapted based on the study population (students). The scales of Bar-On’s standard questionnaires were administered to similar populations. The reliability (Cronbach’s alpha) of Bar-On, Tromsø, and Isenberg’s questionnaires was calculated to be 0.85–91, 0.79–0.91, and 0.73–0.94 in their research, respectively. Tables 1, 2, 3 and 4 present the results of the ordinal coefficient theta for the research variables. The variables were measured on a five-point Likert scale. Some items of the questionnaire included I use good moods to help myself keep trying in the face of obstacles or when I feel a change in emotions, I tend to come up with new ideas (emotional intelligence scale), I can predict other people’s behavior or people often surprise me with the things they do (social intelligence scale), there are many opportunities for students and graduates to develop entrepreneurship or students have easy access to the networks of entrepreneurs and business owners (entrepreneurship ecosystem), I have the ability to write a business plan or I have the ability to gather capable people to form a work team (entrepreneurial skills). Data were analyzed by structural equation modeling in SPSS23 and AMOS22 software packages.

### Table 1 Measurement coefficients, significance level of confirmatory factor analysis, and validity and reliability of latent traits for the entrepreneurship ecosystem

| Latent variables | Observed variables | Standardized loading | AVE | CR | t-Value | R² |
|------------------|--------------------|----------------------|-----|----|---------|----|
| Policy           | eco1               | 0.736                | 0.541| 0.820| Fixed   | 0.541|
|                  | eco2               | 0.931                | 0.541| 0.866|          |     |
|                  | eco3               | 0.589                | 0.820| 0.346|          |     |
|                  | eco4               | 0.641                | 0.346| 0.410|          |     |
|                  | eco5               | Dropped              | -    | -    |          |     |
| Markets          | eco25              | Dropped              | -    | -    |          |     |
|                  | eco26              | 0.745                | 0.587| 0.808| 10.09   | 0.555|
|                  | eco27              | 0.869                | 0.587| 0.755| 10.15   | 0.452|
|                  | eco28              | 0.673                | 0.587| 0.444|          |     |
| Finance          | eco6               | 0.554                | 0.433| 0.750| Fixed   | 0.306|
|                  | eco7               | 0.585                | 0.433| 0.342| 7       | 0.322|
|                  | eco8               | 0.801                | 0.342| 0.641| 8.15    | 0.384|
|                  | eco9               | 0.667                | 0.554| 0.477| 7.58    | 0.477|
| Supports         | eco15              | 0.568                | 0.554| 0.309| 3.98    | 0.309|
|                  | eco16              | 0.620                | 0.479| 0.841| 4.05    | 0.309|
|                  | eco17              | 0.691                | 0.620| 0.329| 4.13    | 0.309|
|                  | eco18              | 0.644                | 0.691| 0.414| 4.08    | 0.309|
|                  | eco19              | 0.556                | 0.644| 0.275| 3.96    | 0.309|
|                  | eco20              | 0.985                | 0.556| 0.275| 4.05    | 0.309|
| Culture          | eco10              | 0.560                | 0.300| 0.682| Fixed   | 0.313|
|                  | eco11              | 0.555                | 0.300| 0.308| 6.61    | 0.313|
|                  | eco12              | 0.574                | 0.555| 0.329| 6.76    | 0.313|
|                  | eco13              | 0.525                | 0.574| 0.275| 6.36    | 0.313|
|                  | eco14              | 0.525                | 0.525| 0.275| 6.37    | 0.313|
| Human capital    | eco21              | 0.670                | 0.729| 0.448|          |     |
|                  | eco22              | 0.753                | 0.406| 0.567| 7.07    | 0.448|
|                  | eco23              | 0.571                | 0.753| 0.567| 6.49    | 0.448|
|                  | eco24              | 0.534                | 0.571| 0.326| Fixed   | 0.285|
Table 2 Measurement coefficients, significance level of confirmatory factor analysis, and validity and reliability of latent traits for emotional intelligence

| Latent variables | Observed variables | Standardized loading | AVE  | CR   | t-Value | R²   |
|------------------|-------------------|----------------------|------|------|---------|------|
| Adaptability     | emot1             | 0.803                | 0.559| 0.752| Fixed   | 0.644|
|                  | emot12            | 0.793                |      |      | 2.98    | 0.628|
|                  | emot16            | 0.624                |      |      | 2.13    | 0.389|
|                  | emot22            | -0.660               |      |      | -3.73   | 0.435|
|                  | emot31            | -0.765               |      |      | -3.78   | 0.585|
|                  | emot37            | -0.704               |      |      | -2.04   | 0.495|
|                  | emot42            | -0.667               |      |      | -3.76   | 0.444|
|                  | emot46            | -0.822               |      |      | -3.31   | 0.675|
|                  | emot52            | 0.739                |      |      | 3.52    | 0.546|
|                  | emot57            | 0.826                |      |      | 2.45    | 0.682|
|                  | emot61            | 0.801                |      |      | 2.45    | 0.641|
|                  | emot67            | 0.583                |      |      | 1.99    | 0.339|
|                  | emot72            | 0.667                |      |      | 2.46    | 0.444|
|                  | emot76            | 0.627                |      |      | 2.46    | 0.393|
|                  | emot82            | 0.899                |      |      | 2.45    | 0.808|
|                  | emot87            | 0.888                |      |      | 3.90    | 0.788|
|                  | emot7             | Dropped              |      |      | -       | -    |
|                  | emot14            | Dropped              |      |      | -       | -    |
| Mood             | emot2             | 0.718                | 0.479| 0.9  | Fixed   | 0.515|
|                  | emot9             | 0.460                |      |      | 2.95    | 0.211|
|                  | emot17            | 0.711                |      |      | 3.12    | 0.505|
|                  | emot24            | 0.820                |      |      | 3.10    | 0.672|
|                  | emot32            | 0.621                |      |      | 2.54    | 0.385|
|                  | emot39            | 0.689                |      |      | 2.04    | 0.474|
|                  | emot47            | 0.765                |      |      | 2.93    | 0.585|
|                  | emot62            | 0.658                |      |      | 2.81    | 0.432|
|                  | emot69            | 0.604                |      |      | 2.19    | 0.364|
|                  | emot77            | 0.806                |      |      | 2.39    | 0.649|
|                  | emot54            | Dropped              |      |      | -       | -    |
|                  | emot84            | Dropped              |      |      | -       | -    |
| Stress management| emot4             | 0.494                | 0.504| 0.908| Fixed   | 0.244|
|                  | emot11            | 0.585                |      |      | 7.11    | 0.342|
|                  | emot19            | 0.715                |      |      | 7.90    | 0.511|
|                  | emot26            | 0.710                |      |      | 7.88    | 0.504|
|                  | emot49            | 0.813                |      |      | 6.20    | 0.660|
|                  | emot55            | 0.751                |      |      | 2.34    | 0.564|
|                  | emot64            | 0.622                |      |      | 3.91    | 0.386|
|                  | emot71            | 0.782                |      |      | 2.81    | 0.611|
|                  | emot79            | 0.766                |      |      | 3.96    | 0.586|
|                  | emot86            | 0.795                |      |      | 4.08    | 0.632|
|                  | emot34            | Dropped              |      |      | -       | -    |
|                  | emot41            | Dropped              |      |      | -       | -    |
| Latent variables       | Observed variables | Standardized loading | AVE | CR | t-Value | R²  |
|-----------------------|--------------------|----------------------|-----|----|---------|-----|
| **Intra-personal skills** | emot8              | 0.467                | 0.478 | 0.934 | Fixed  | 0.218 |
|                       | emot13             | 0.765                | 6.36  | 0.585 |
|                       | emot14             | 0.648                | 6.13  | 0.419 |
|                       | emot23             | 0.643                | 6.12  | 0.413 |
|                       | emot28             | 0.555                | 6.78  | 0.308 |
|                       | emot29             | 0.781                | 6.14  | 0.609 |
|                       | emot38             | 0.661                | 5.55  | 0.436 |
|                       | emot43             | 0.746                | 6.66  | 0.556 |
|                       | emot44             | 0.893                | 8.30  | 0.797 |
|                       | emot53             | 0.554                | 4.76  | 0.306 |
|                       | emot68             | 0.672                | 6.01  | 0.451 |
|                       | emot73             | 0.659                | 6.83  | 0.434 |
|                       | emot74             | 0.667                | 5.95  | 0.444 |
|                       | emot83             | 0.702                | 6.43  | 0.492 |
|                       | emot88             | 0.808                | 8.12  | 0.652 |
|                       | emot89             | 0.723                | 7.72  | 0.522 |
|                       | emot58             | Dropped              | -     | -    |
|                       | emot59             | Dropped              | -     | -    |
| **Interpersonal skills** | emot3              | 0.523                | 0.480 | 0.959 | Fixed  | 0.273 |
|                       | emot5              | 0.483                | 6.4   | 0.233 |
|                       | emot6              | 0.873                | 4.03  | 0.762 |
|                       | emot10             | 0.344                | 4.92  | 0.118 |
|                       | emot15             | 0.615                | 7.51  | 0.378 |
|                       | emot18             | 0.643                | 7.72  | 0.413 |
|                       | emot20             | 0.739                | 8.33  | 0.546 |
|                       | emot21             | 0.718                | 8.21  | 0.515 |
|                       | emot25             | 0.755                | 8.43  | 0.570 |
|                       | emot33             | 0.895                | 6.77  | 0.801 |
|                       | emot35             | 0.724                | 6.37  | 0.524 |
|                       | emot36             | 0.729                | 6.45  | 0.531 |
|                       | emot40             | 0.744                | 6.68  | 0.553 |
|                       | emot45             | 0.861                | 7.94  | 0.741 |
|                       | emot48             | 0.759                | 7.92  | 0.576 |
|                       | emot50             | 0.737                | 7.57  | 0.543 |
|                       | emot55             | 0.538                | 2.12  | 0.289 |
|                       | emot60             | 0.585                | 2.32  | 0.342 |
|                       | emot63             | 0.773                | 2.64  | 0.597 |
|                       | emot65             | 0.707                | 6.66  | 0.499 |
|                       | emot66             | 0.715                | 6.77  | 0.511 |
|                       | emot70             | 0.881                | 2.76  | 0.776 |
|                       | emot75             | 0.794                | 6.45  | 0.630 |
|                       | emot78             | 0.531                | 2.01  | 0.281 |
|                       | emot80             | 0.494                | 3.46  | 0.244 |
|                       | emot81             | 0.736                | 2.10  | 0.541 |
|                       | emot90             | 0.414                | 2.16  | 0.171 |
|                       | emot85             | Dropped              | -     | -    |
|                       | emot30             | Dropped              | -     | -    |
|                       | emot51             | Dropped              | -     | -    |
Results

Demographic characteristics of the students

The results for the demographic characteristics showed that 44.2% (119 individuals) of the respondents were male and 55.8% (150 individuals) were female. The studied students were, on average, 25.86 years old (SD = 5.14). Also, 58.7% (158 individuals) were undergraduate students, and the remaining were postgraduate students of whom 33.5% (90 individuals) were studying at the master’s level and 7.8% (21 individuals) at the Ph.D. level. In addition, their grade point average (GPA) was, on average, 15.89 of 20.00 (SD = 1.48).

Structural equation modeling (SEM)

The effects of the entrepreneurship ecosystem on entrepreneurial skills were analyzed by SEM. Accordingly, first, the measurement section of the model (to check the validity and reliability of the measurements used) and then, its structural section (to support the theoretical relationships of the variables of the theoretical framework) was assessed. In addition, the overall fit of the model was checked by different indices to ensure the conformity and overall agreement of the model with empirical data.

Estimation of the measurement model

The reliability and validity of the questionnaire were measured by composite reliability (CR) and the discriminant validity was estimated by average variance extracted (AVE). Constructs whose CR is greater than 0.6 are reliable enough. The closer the CR is to 1, the higher the reliability is (Raykov, 1998). Also, constructs whose AVE is greater than 0.5 are valid enough (Iglesias, 2004).

To check the reliability of the model, it is also necessary to check the degree and level of significance of the paths between each latent variable and its related indicators. So, confirmatory factor analysis was employed to test the hypothesis as to whether indicators considered for a construct or latent variable really express it and how accurately the selected indicators can describe the latent variable or how fit they are to the latent variable. Since parameters with values of greater than 1.96 are statistically significant (Bentler & Yuan, 1999), the results revealed that the indicators used to measure the latent traits studied here were in good agreement with the factor structure and the theoretical framework of the research. The reliability of the indicators can be measured by the square of multiple correlations (R²), which shows the amount of variance in each indicator accounted for by the related latent variable (Tables 1, 2, 3 and 4).

Table 3 Measurement coefficients, significance level of confirmatory factor analysis, and validity and reliability of latent traits for social intelligence

| Latent variables      | Observed variables | Standardized loading | AVE   | CR    | t-Value | R²   |
|-----------------------|--------------------|----------------------|-------|-------|---------|------|
| Social awareness      | socio14            | 0.508                | 0.461 | 0.833 | Fixed   | 0.258|
|                       | socio15            | 0.767                | 7.89  | 0.588 |
|                       | socio16            | 0.737                | 7.75  | 0.543 |
|                       | socio17            | 0.824                | 8.11  | 0.678 |
|                       | socio18            | 0.584                | 6.85  | 0.341 |
|                       | socio19            | 0.599                | 6.96  | 0.358 |
|                       | socio20            | Dropped              | -     | -     |         |      |
| Social skills         | socio8             | 0.558                | 0.423 | 0.776 | Fixed   | 0.311|
|                       | socio9             | 0.570                | 7.81  | 0.324 |
|                       | socio10            | 0.437                | 6.38  | 0.190 |
|                       | socio13            | 0.887                | 7.26  | 0.786 |
|                       | socio21            | 0.711                | 9.06  | 0.505 |
|                       | socio11            | Dropped              | -     | -     |         |      |
|                       | socio12            | Dropped              | -     | -     |         |      |
| Social information    | socio7             | 0.798                | 0.463 | 0.853 | Fixed   | 0.636|
|                       | socio6             | 0.762                | 13.55 | 0.580 |
|                       | socio5             | 0.853                | 15.69 | 0.727 |
|                       | socio4             | 0.515                | 8.53  | 0.265 |
|                       | socio3             | 0.562                | 9.40  | 0.315 |
|                       | socio2             | 0.572                | 9.60  | 0.327 |
|                       | socio1             | 0.624                | 10.61 | 0.389 |
Structural model estimation

After the measurement model was estimated, the second step in the model estimation was to test the significance of coefficients for the paths assumed in the research model. Before estimating the path coefficients, the model’s fit indices were tested. To understand the extent to which the model was consistent with the data, the overall fit of the model was assessed using the relevant indices of fitness. They are listed in Table 5, which shows that most reported indices were in the acceptable ranges for the overall fit of the model. So, it can be said that the model was consistent with the data used.

Based on the structural model, the entrepreneurship ecosystem had a direct impact on social intelligence and emotional intelligence and a direct and indirect impact on entrepreneurial skills. It was found that the effect of entrepreneurship ecosystem was positive and significant on both social intelligence ($\beta = 0.16; P < 0.05$) and emotional intelligence ($\beta = 0.359; P < 0.000$). The results showed that social intelligence had a positive and significant impact on

| Latent variables                                      | Observed variables | Standardized loading | AVE | CR  | t-Value | R²  |
|-------------------------------------------------------|--------------------|----------------------|-----|-----|---------|-----|
| Knowledge of business plan                            | skill1             | 0.643                | 0.443 | 0.798 | Fixed   | 0.413 |
|                                                       | skill2             | 0.730                |       | 9.63 |         | 0.532 |
|                                                       | skill3             | 0.649                |       | 8.80 |         | 0.421 |
|                                                       | skill4             | 0.693                |       | 9.26 |         | 0.480 |
|                                                       | skill5             | 0.609                |       | 8.36 |         | 0.370 |
| Communication                                         | skill6             | 0.637                | 0.354 | 0.729 | Fixed   | 0.405 |
|                                                       | skill7             | 0.474                |       | 6.63 |         | 0.224 |
|                                                       | skill8             | 0.627                |       | 8.39 |         | 0.393 |
|                                                       | skill9             | 0.674                |       | 8.86 |         | 0.454 |
|                                                       | skill10            | 0.542                |       | 7.45 |         | 0.293 |
| Familiarity with legal and commercial rules and regulations | skill11            | 0.737                | 0.633 | 0.838 | Fixed   | 0.543 |
|                                                       | skill12            | 0.834                |       | 12.57|         | 0.695 |
|                                                       | skill13            | 0.814                |       | 12.36|         | 0.662 |
| Planning                                              | skill17            | 0.708                | 0.525 | 0.815 | Fixed   | 0.501 |
|                                                       | skill16            | 0.752                |       | 10.74|         | 0.565 |
|                                                       | skill15            | 0.748                |       | 10.70|         | 0.559 |
|                                                       | skill14            | 0.690                |       | 9.98 |         | 0.476 |
| Team-building                                         | skill22            | 0.699                | 0.553 | 0.860 | Fixed   | 0.488 |
|                                                       | skill21            | 0.799                |       | 11.63|         | 0.638 |
|                                                       | skill20            | 0.767                |       | 11.23|         | 0.588 |
|                                                       | skill19            | 0.732                |       | 10.77|         | 0.535 |
|                                                       | skill18            | 0.719                |       | 10.61|         | 0.516 |
| Marketing                                             | skill27            | 0.799                | 0.513 | 0.839 | Fixed   | 0.638 |
|                                                       | skill26            | 0.750                |       | 12.49|         | 0.562 |
|                                                       | skill25            | 0.711                |       | 11.77|         | 0.505 |
|                                                       | skill24            | 0.717                |       | 11.88|         | 0.514 |
|                                                       | skill23            | 0.588                |       | 9.49 |         | 0.345 |

Table 5 The fit indices of the structural model

| Test                              | Recommended value | Proposed model |
|-----------------------------------|-------------------|----------------|
| Likelihood ratio Chi-square ($\times 2$) | Insignificant $\times 2$ ($p > 0.05$) | 0.000          |
| Normed chi-square ($\times 2$/df)  | $\times 2$/df $< 5$ | 1.58           |
| Root Mean Square Residual         | RMR $< 0.05$      | 0.06           |
| Root Mean Squared Error           | RMSEA $< 0.08$    | 0.04           |
| Goodness-of-Fit Index             | GFI $> 0.90$      | 0.92           |
| Incremental Fit Index             | IFI = Values close to 1 | 0.96       |
| Comparative Fit Index             | CFI $> 0.90$      | 0.95           |
the students’ entrepreneurial skills ($\beta = 0.205; P < 0.03$). On the other hand, as is evident in Table 6, entrepreneurial skills were positively and significantly influenced by emotional intelligence ($\beta = 0.367; P < 0.000$) and entrepreneurship ecosystem ($\beta = 0.18; P < 0.05$).

The results, also, revealed that $R^2$ was 0.59 for the students’ entrepreneurial skills, implying that 59% of the variance in the variable of entrepreneurial skills among the students of the agriculture faculty was related to the three variables of entrepreneurship ecosystem, social intelligence, and emotional intelligence. In other words, it can be claimed that the elements of the research’s conceptual framework could capture 59% of the variance in entrepreneurial skills (Fig. 2).

**Table 6 The estimation of the structural model’s paths**

| Independent variable                  | Dependent variable     | Standardized coefficient | t-Value | Sig |
|--------------------------------------|------------------------|--------------------------|---------|-----|
| Entrepreneurship ecosystem            | Social intelligence    | 0.16                     | 1.97    | 0.05|
|                                      | Emotional intelligence | 0.359                    | 3.79    | 0.000|
|                                      | Entrepreneurial skills | 0.180                    | 1.99    | 0.05|
| Social intelligence                   | Entrepreneurial skills | 0.205                    | 2.15    | 0.031|
| Emotional intelligence                |                        | 0.367                    | 4.92    | 0.000|

Fig. 2  The structural model of the research
Discussion

The results showed that the entrepreneurship ecosystem had a significant impact on the students’ social intelligence. This means that a network of different elements (e.g., human capital, markets, finance, supports, culture, and policy) is formed and affects the students’ social intelligence. The entrepreneurship ecosystem acts as a motive and reinforces social information processing, social awareness, and social skills. Other researchers (Aliabadi et al., 2019; Hosseininia et al., 2019) have concluded that if the infrastructure for launching entrepreneurial businesses is provided in the context of an ecosystem, the cognitive features of the individuals can be activated and reinforced, thereby supplying the requirements for the development of entrepreneurship. On the other hand, the entrepreneurship ecosystem affected the students’ emotional intelligence positively and significantly. This implies that the adoption of an entrepreneurship ecosystem approach in universities, which means the creation of a supportive climate, can improve the students’ capability in identifying their emotions and those of others to stimulate and manage their emotions and relations. This finding is in agreement with the results of Mousivand et al. (2017), Aliabadi et al. (2016), Izadi et al. (2020), and Ataei et al. (2020). They have concluded that by creating an entrepreneurial environment, people’s psychological attributes can be stimulated.

The results revealed the significant effect of the entrepreneurship ecosystem on the students’ entrepreneurial skills. In an entrepreneurship ecosystem, students not only accumulate human capital and knowledge but also acquire entrepreneurial skills and use them to produce, distribute, assimilate, and commercialize new knowledge. It can be argued that by providing market conditions, finance, supports, human capital, culture, and policy, the students can be encouraged towards acquiring different entrepreneurial skills to launch innovative businesses. It can be argued that by providing an entrepreneurship ecosystem’s infrastructure and components, the psychological characteristics of students can be strengthened. In other words, the entrepreneurship ecosystem can prepare the students’ mental conditions for acquiring different entrepreneurial skills and launching innovative businesses. This corroborates the findings reported by Lyons et al. (2020), Guerrero et al. (2020), Ben Hassen (2020), and Hsieh and Kelley (2020) according to whom a dynamic entrepreneurial ecosystem can enhance entrepreneurial skills among people. Based on the results, it was specified that social intelligence can affect students’ entrepreneurial skills. In other words, if the students have the capability of understanding and controlling their emotions and use them to help their intellectual, decision-making, and communicational activities, they can acquire the skills required for launching a business. The same point has been stated by Alizade Aghdam et al. (2016) and Jin (2020), who found a mutual relationship between entrepreneurial skills and social intelligence of people. Besides, the effect of social intelligence was found to be positive and significant on the students’ entrepreneurial skills. People with higher emotional intelligence are more likely to establish an entrepreneurial business because they can cope with their negative emotions caused by work and the environment during the establishment and administration of a new business. This finding supports the results of Karimi (2016), Rezaei (2017), Yitshaki (2012), Rhee and White (2007), and Azma and Kannadas (2020). They have reported that emotional intelligence can prepare people to enhance their entrepreneurial skills and increase their motivation to cope with market skills. In other words, a set of psychological traits (e.g., social and emotional intelligence) under the umbrella of the entrepreneurship ecosystem influence students’ entrepreneurial skills. The deeper the gap between the components of an entrepreneurship ecosystem is, the more unsuccessful the students will be in using their social and emotional intelligence to acquire entrepreneurial skills.

Conclusion

Innovative and entrepreneurial businesses are formed and developed within the framework of an ecosystem. The presence of a proper entrepreneurship ecosystem in universities largely assures the sustainability of knowledge-intensive businesses. So, the present study aimed to study the effect of the entrepreneurship ecosystem on the agriculture students’ entrepreneurial skills mediated by social and emotional intelligence. An entrepreneurial ecosystem encompasses diverse stakeholders, e.g. universities, entrepreneurs, policymakers, public and private sector organizations, knowledge-intensive enterprises, and so on. For the students and graduates to launch innovative businesses, these stakeholders should interact in a free and open economy, a stable and efficient political environment, a high-quality monitoring environment, a simple and flexible business environment, and a knowledge-intensive cultural climate.

The current study explored students’ perceptions of the entrepreneurship ecosystem and their self-reported entrepreneurial skills. The results indicated a mismatch between students’ perceptions and the policies and efforts of the university to create a supportive climate. In other words, students believed that the components of the university entrepreneurship ecosystem (human capital, markets, finance, supports, culture, and policy) were not strong supporters to improve their entrepreneurial skills.
However, in an entrepreneurial ecosystem, the students’ entrepreneurial skills and psychological attributes play a key role so that the formation and development of an innovative business depend on the entrepreneurship ecosystem, entrepreneurial skills, and psychological attributes of the students. The results suggest that the entrepreneurship ecosystem has an essential effect on the students’ entrepreneurial skills, social intelligence, and emotional intelligence. It can be concluded that the interaction and coordination of an entrepreneurship ecosystem’s components provide the students with the appropriate conditions to use their social and emotional intelligence to acquire entrepreneurial skills. On the other hand, the variables of emotional intelligence and social intelligence were positively and significantly influential on the students’ entrepreneurial skills. It can be drawn that students with higher social and emotional intelligence and the improvement of entrepreneurship ecosystem’s components will lay the ground for the students to acquire and strengthen their entrepreneurial skills.

Among different actors, the role that lawmakers, policymakers, and relevant officials should play in providing an optimal ecosystem is crucial. So, to fill the gaps, which are mainly related to the performance of law-making institutions and executive sectors, lawmakers and executives should consider the different aspects of entrepreneurship and the creation of an optimal business environment. Thereby, proper conditions are provided to students and graduates who intend to launch an entrepreneurial business with the participation of experienced people because they mostly have adequate knowledge, as well as extensive communications, to develop a business and this can increase the chance of their success and the development of the business. On the other hand, to encourage students and develop innovative businesses among graduates, attempts should be made to facilitate the issue of licenses for the establishment of new businesses by the relevant institutions. Also, good financing will pave the way to motivate the students for starting their own businesses. Furthermore, since emotional intelligence and social intelligence are to be acquired, materials can be included in academic programs to enhance them in students. Educational planners and employment policymakers should also perceive the strategic value of emotional intelligence and social intelligence. Then, they can motivate students to acquire entrepreneurial skills and create a competitive advantage in the marketplace and businesses.

This study revealed some important findings, but they are still required to be extended at a greater depth. It is recommended to undertake research with a broader sample of various universities. A further study could investigate how universities can apply the model to their entrepreneurship curriculum and evaluate students’ entrepreneurship skills. How the model holds up in a longer-term study and how it applies to other universities in different fields and social contexts could be another interesting avenue for a future investigation.

Like all studies, this study was subject to some limitations. The responses depended on the respondents’ willingness to honestly and reliably recall and report their experiences. Special attention should also be paid to the students’ responses to external shakeouts (COVID-19 pandemic, compactness of exams). It also requires the use of different scales to evaluate the students’ entrepreneurship skills instead of their self-reported entrepreneurial skills. However, given the limitations of our data set, we did not test the effectiveness and the success of entrepreneurship education programs.

Acknowledgements This work was funded by the University of Zabol. Project code: PR-UOZ99-1

Data availability statement The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethical approval This is a survey study. The Research Ethics Committee has confirmed that no ethical approval is required.

Informed consent The participants have consented to the submission of the paper to the journal.

Conflict of interest The authors declare that they have no conflict of interest.

References

Agha Ahmadi, Q. A., Halimi, P. & Kiadiri, L. (2012). Investigating the relationship between social intelligence and entrepreneurial skills of Chalous Azad University students. The second student entrepreneurship conference in Mazandaran University, 2-3 May, Sari.

AhmadiKafeshani, A., & Nazemi, A. (2014). The relationship between emotional intelligence and entrepreneurial intention of students. Sport Management, 22(22), 421–441.

Ahmetoglu, G., Leutner, F., & Chamorro-Premuzic, T. (2011). EQ-nomics: Understanding the relationship between individual differences in Trait Emotional Intelligence and entrepreneurship. Personality and Individual Differences, 51(8), 1028–1033.

Aliabadi, V., Ataei, P., & Movahedi, R. (2016). The effect of strategic thinking and social capital on recognition of entrepreneurial opportunities among rural youth. Journal of Research and Rural Planning, 3(2), 95–110. https://doi.org/10.22067/jrrp.v3i2.46072

Aliabadi, V., Ataei, P., Gholamrezai, S., & Aazami, M. (2019). Components of sustainability of entrepreneurial ecosystems in knowledge-intensive enterprises: The application of fuzzy analytic hierarchy process. Small Enterprise Research, 26(3), 288–306. https://doi.org/10.1080/13215906.2019.1671215

Alizade Aghdam, M. B., Abbaszadeh, M., & Hayati, S. (2016). The Relationship between social intelligence with entrepreneurial Ability Graduate students of Tabriz University. Quarterly of Social Studies and Research in Iran, 5(3), 345–368.
Ataei, P., Ghadermarzi, H., Karimi, H., & Norouzi, A. (2020). The process of adopting entrepreneurial behaviour: Evidence from agriculture students in Iran. *Innovations in Education and Teaching International, 1*-11. https://doi.org/10.1080/14703297.2020.1734476

Azma, I., & Kannadas, P. (2020). A study on antecedents and consequences of emotional intelligence among the women entrepreneurs in selected micro scale enterprises in madurai district. *International Journal of Advanced Science and Technology, 29*(4 Special Issue), 529–539.

Bardzil, F., & Slaski, M. (2003). Emotional intelligence fundamental competencies for enhanced service provision. *Managing Service Quality, 13*(2), 56–140.

Bar-On, R. (1997). *The Bar-On emotional quotient inventory (EQ-i): A test of emotional intelligence*. Multi-Health Systems.

Baron, R. A. (2008). The role of affect in the entrepreneurial process. *The Academy of Management Review, 33*(2), 328–340. https://doi.org/10.2307/20159400

Ben Hassen, T. (2020). The entrepreneurship ecosystem in the ICT sector in Qatar: Local advantages and constraints. *Journal of Small Business and Enterprise Development, 27*(2), 177–195. https://doi.org/10.1108/JSBED-04-2019-0119

Bentler, P. M., & Yuan, K. H. (1999). Structural equation modeling with small samples: Test statistics. *Multivariate Behav Res, 34*(2), 181–197. https://doi.org/10.1207/S15327906MB340203

Björkqvist, K., Österman, K., & Kaukiainen, A. (2000). Social intelligence - empathy = aggression? *Aggression and Violent Behavior, 5*(2), 191–200.

Boren, A. E. (2010). Emotional intelligence: The secret of successful entrepreneurship? *Faculty Publications: Agricultural Leadership, Education & Communication Department, 10*(2), 55–61.

De Araujo, R. G. B., da Costa, M. V. A., Joseph, B., & Sanchez, J. L. G. (2020). Developing professional and entrepreneurial skills of engineering students through problem-based learning: A case study in Brazil. *International Journal of Engineering Education, 36*(1), 155–169.

Dizji, M., & Zini, M. (2018). Investigating the effect of university education on the development of women's entrepreneurial skills. *Technology Development Quarterly, 15*(57), 43–34.

Entezari, Y. (2018). Innovative entrepreneurship ecosystem: General patterns and its lessons for Iran. *Journal of Entrepreneurship Development, 11*(1), 21–40.

FakhreDin, H. (2017). The relationship between the emotional intelligence of entrepreneurs and the new venture creation: The role of age, gender and motive. *Arab Economic and Business Journal, 12*(2), 99–108.

Fallah Haghighi, N., & Bijani, M. (2016). A Qualitative Approach on Conceptualizing an Entrepreneurial University (The Case of Jönköping University, Sweden). *INTAN Management Journal, 6*, 25–30.

Fallah Haghighi, N., Hajihoseini, H., RamezanpourtNargesi, G., & Bijani, M. (2018a). Gap analysis of current and desired states of entrepreneurship development components in the field of ICTs in Iran. *Technology in Society, 54*, 101–110. https://doi.org/10.1016/j.techsoc.2018.03.003

Fallah Haghighi, N., Mahmoudi, M., & Bijani, M. (2018b). Barriers to entrepreneurship development in iran’s higher education: A qualitative case study. *Interchange, 49*(3), 353–375. https://doi.org/10.1007/s10780-018-9330-9

Frankovsky, M., & Birknerová, Z. (2014). Measuring Social Intelligence-The MESI Methodology. *Asian Social Science, 10*(6), 90.

Ghambarali, R., Agahi, H., Alibeigi, A. H., & Zarafshani, K. (2016). Content analysis of policies being appropriate to the entrepreneur education programmes and graduates’ career patterns: Do entrepreneurship education programmes and university business incubators matter? *Journal of Management Development. https://doi.org/10.1108/JMD-10-2019-0439*

Hosseini, S. M., & Yaqoubi, J. (2005). Investigating the barriers to entrepreneurship in agricultural higher education and strategies for strengthening it. *Scientific Conference on Agricultural Education, Tehran.*

Hosseininia, G., Ataei, P., & YaghoubiFarani, A. (2017). An assessment of students’ entrepreneurial skills and characteristics and the impact on their entrepreneurial intention: a case of maharat applied science centers. *Iranian Journal of Engineering Education, 19*(73), 25–44. https://doi.org/10.22047/ije.2017.61340.1408

Hosseininia, G. H., Aliabadi, V., & Ataei, P. (2019). Configuring Dimensions of cooperative-oriented entrepreneurship ecosystem within small rural enterprises. *Journal of Entrepreneurship Development, 12*(3), 341–360. https://doi.org/10.22059/jed.2019.286203.653083

Hsieh, R. M., & Kelley, D. (2020). A study of key indicators of development for university-based entrepreneurship ecosystems in Taiwan. *Entrepreneurship Research Journal, 10*(2). https://doi.org/10.1515/erj-2018-0331

Iglesias, V. (2004). Preconceptions about service: How much do they influence quality evaluations? *Journal of Service Research, 7*(1), 90–103. https://doi.org/10.1177/1094670504266139

ImaniJajromi, H., & PourrajabMiyandoab, P. (2012). Review and assessment of the characteristics of Dehyaran entrepreneurial and the effect of technical and professional skills on it. *Journal of Community Development, 3*(2), 107–126.

Isenberg, D. (2011). *The entrepreneurship ecosystem strategy as a new paradigm for economic policy: principles for cultivating entrepreneurship* (pp. 1–32). Presentation at the Institute of International and European Affairs.

Isma'il, A., Adnan, W. N., Masek, A., Hassan, R., Hashim, S., & Isma'il, M. E. (2019). Effectiveness of entrepreneurship programmes in developing entrepreneurship skills towards quality TVET graduates. *Journal of Technical Education and Training, 11*(1), 81–86. https://doi.org/10.30880/jtet.2019.11.01.10

Izadi, N., YaghoubiFarani, A., & Ataei, P. (2020). Determinants for entrepreneurial behavior among members of virtual agricultural social networks. *Journal of Entrepreneurial Strategies in Agriculture, 6*(12), 48–58.

Jin, B. (2020). The Practical Intelligence of Social Entrepreneurs: Managing the Hybridity of Social Enterprises. *Entrepreneurship Research Journal, 10*(1). https://doi.org/10.1515/erj-2018-0007

Karimi, S. (2016). Studying the Role of Emotional Intelligence in Developing Entrepreneurial Intentions of Agricultural Students (Case Study: Bu-Ali Sina, Razi, Kordestan and Lorestan Universities). *Iranian Agricultural Extension and Education Journal, 12*(1), 71–84.

Kashani, T., Rasouli, M., & Soleimanpour, M. (2017). Evaluate the Factors Affecting Entrepreneurial Skills of Agricultural Students in Technical and Vocational University of Tehran. *Agricultural Extension and Education Research, 10*(1), 53–64.

Khayri, S., Yaghoubi, J., & Yazdanpanah, M. (2011). Investigating barriers to enhance entrepreneurship in agricultural higher education from the perspective of graduate students. *Procedia- Social and Behavioral Sciences, 15*, 2818–2822.

Khosravi, A. A., Keshktrkh, S., & Mirzabezhi, M. A. (2014). Investigating the degree of coordination of the implemented curriculum of the master’s degree course in educational sciences with entrepreneurial skills. *Journal of Higher Education Curriculum Studies, 5*(9), 107–123.
Kong, F., & Zhao, J. (2013). Affective mediators of the relationship between trait emotional intelligence and life satisfaction in young adults. *Personality and Individual Differences, 54*, 197–201.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement, 30*, 607–610.

Lyons, T. S., Lyons, J. S., & Jolley, G. J. (2020). Entrepreneurial skill-building in rural ecosystems: A framework for applying the Readiness Inventory for Successful Entrepreneurship (RISE). *Journal of Entrepreneurship and Public Policy, 9*(1), 112–136. https://doi.org/10.1108/jeppp-09-2019-0075

Malecki, E. J. (2011). Connecting local entrepreneurial ecosystems to global innovation networks: Open innovation, double networks and knowledge integration. *International Journal of Entrepreneurship and Innovation Management, 14*(1), 36–59.

Mansuri, S., Vazifeh, Z., & YusefiTabas, H. (2017). Prioritizing the effective factors in the development of knowledge-based companies of Kerman. *Journal of Entrepreneurship Development, 10*(2), 319–338.

Mardanshahi, M. M., Esmaeili, A. T., & Mobarak, M. H. (2015). in Junior and Senior Students of State Universities (Case Study: State Universities of Mazandaran Province). *Journal of Entrepreneurship Development, 7*(4), 755–771.

Mason, C., & Brown, R. (2014). Entrepreneurial ecosystems and growth oriented entrepreneurship. *Final Report to OECD, Paris, 2014*(1), 77–102.

McLaughlin, E. B. (2012). An Emotional Business: The Role of Emotional Intelligence In Entrepreneurial Success. Dissertation Prepared for the Degree of PhD. M.B.A. *9*(3): 170–205.

Miller, D. J., & Acs, Z. J. (2017). The campus as entrepreneurial ecosystem: The University of Chicago. *Small Business Economics, 49*(1), 75–95.

MohammadiElyasi, G., & Notash, H. (2012). Identifying the failure causes of habitual Iranian entrepreneurs: A narrative approach. *Journal of Entrepreneurship Development, 4*(3), 31–50.

Moradi, H., Bijani, M., Fallah Haghighi, N., Bossagh, M. R., & Raesi, M. (2012). An investigation of organizational entrepreneurship by using analysis of managerial-organizational factors in agricultural extension agency of Kermanshah Province in Iran. *International Journal of Agriscience., 2*(6), 558–570.

MoradiPardanjani, H., SadeghiDehCheshmeh, S., & Bayati, Y. (2015). The effect of social intelligence on social entrepreneurial (Case study: Basij managers of Chaharmahal Bakhtiari province). *Basij Strategic Studies Quarterly, 18*(69), 149–131.

Moradi-Pordanjani, H. A., & Sadeghi-Dehcheshmeh, S. (2014). The relationship between cultural, emotional, organizational and social intelligence with entrepreneurship attitudes (Case Study: Managers of Small and Medium Businesses In Iran). *Management Research Report, 2*(4), 4315–4323.

Mortan, R. A., Ripoll, P., Carvalho, C., & Bernal, M. C. (2014). Effects of emotional intelligence on entrepreneurial intention and self-efficacy. *Revistade Psicologiadetrabajoydolores Organizaciones, 30*(3), 97–104.

Mousivand, M., Hamidi Jahed, M., Aetaei, P., & SafaeiShakib, A. (2017). Influence of internal factors in University on the Entrepreneurial Culture among Agricultural Students of Hamedan Universities. *Socio-Cultural Development Studies, 6*(1), 185–206.

Nagrodzkiwicz, A. (2013). *Building entrepreneurship ecosystems* (pp. 18–21). Economic Reform Features Services, Center for International Private Enterprise.

Parvin, L., Rahman, M. W., & Jia, J. (2012). Determinates of women microentrepreneurship development: An empirical investigation in rural Bangladesh. *International Journal of Economics and Finance, 4*(5), 254–260.

Pradhan, R. K., & Nath, P. (2012). Perception of entrepreneurial orientation and emotional intelligence: A study on India’s future techno-managers. *Global Business Review, 13*(1), 89–108.

Raykov, T. (1998). Coefficient Alpha and composite reliability with interrelated nonhomogeneous items. *Applied Psychological Measurement, 22*(4), 375–385. https://doi.org/10.1177/014662169802200407

Regele, M. D., & Neck, H. M. (2012). The entrepreneurship education subecosystem in the United States: Opportunities to increase entrepreneurial activity. *Journal of Business & Entrepreneurship, 23*(2), 25–47.

Reyad, S. M. R., Al-Sartawi, A. M., Badawi, S., & Hamdan, A. (2019). Do entrepreneurial skills affect entrepreneurship attitudes in accounting education? *Higher Education Skills and Work-Based Learning, 9*(4), 739–757. https://doi.org/10.1108/heswbl-01-2019-0013

Rezaei, M. (2017). Relationship between emotional intelligence and entrepreneurial capacity of agricultural students. *Journal of Agricultural Education Administration Research, 8*(39), 28–40.

Rhee, K. S., & White, R. J. (2007). The emotional intelligence of entrepreneurs. *Journal of Small Business and Entrepreneurship, 20*(4), 409–425. https://doi.org/10.1080/08276331.2007.10593408

Safari, S., & Samiazaadeh, M. (2012). Needs assessment of entrepreneurship knowledge and skill education a comparative approach in different fields of humanities. *Journal of Technology of Education (JTE), 7*(1), 65–79.

Sajjadi Qeïdari, H., Mahmoody, H., & Jafari, F. (2017). An analysis of entrepreneurial skills of women in rural areas: A case study of villages in Central District of Fariman. *Journal of Rural Research, 8*(2), 242–263.

SalehiEmran, A., & Yaghmouri, S. (2010). Study of job-creating job market skills according to the global economy in higher education curricula. *Curriculum Studies, 16*, 188–165.

Silvera, D., Martinussen, M., & Dahl, T. I. (2001). The Tromsø social intelligence scale, a self-report measure of social intelligence. *Scandinavian Journal of Psychology, 42*(4), 313–319.

Srokes, J., & Ramraj, R. (2012). Entrepreneurial ecosystem: Case study on the influence of environmental factors on entrepreneurial success. *European Journal of Business and Management, 4*(16), 95–101.

Tabatabaei, Z., Ojinejad, H. R., & Ghaltash, A. (2015). The relationship between social intelligence with entrepreneurship skills and creativity among technical high school students in Shiraz. * Quarterly Journal of New Approaches in Educational Administration, 6*(1), 85–102.

Theodotou, M. (2012). *Cyprus entrepreneurship ecosystem: A roadmap for economic growth* (November 2012 edition, pp. 8–12). Curveball Limited.

Tripathy, M. (2019). Overcoming the major challenges in new entrepreneurship: An orientation through soft skills. *Smart-Journal of Business Management Studies, 15*(2), 38–46. https://doi.org/10.5958/2321-2012.2019.00013.7

Tsai, W. H., & Kuo, H. C. (2011). Entrepreneurship policy evaluation and decision analysis for SMEs. *Expert Systems with Applications, 38*, 8343–8351.

Woodcock, C. S. E., Shekhar, P., & Huang-Saad, A. (2019). Examining project based entrepreneurship and engineering design course professional skills outcomes. *International Journal of Engineering Education, 35*(2), 631–644.

Yaghoubifarani, A., Karimi, S., Izadi, N., & Aetaei, P. (2019). Effect of virtual social networks on entrepreneurial behavior of agricultural students. *Applied Economics, 51*(21), 2326–2335.

Yoshida, R. (2012). How do entrepreneurs’ emotional intelligence and transformational leadership orientation impact new ventures’ growth? *Journal of Small Business and Entrepreneurship, 25*(3), 357–374. https://doi.org/10.1080/08276331.2012.10593578
Zampetakis, L. A., Kaletsios, K., Bouranta, N., Dewett, T., & Moustakis, V. S. (2012). On the relationship between emotional intelligence and entrepreneurial attitudes and intentions. *International Journal of Entrepreneurial Behaviour & Research, 15*(6), 595–618.

Zarei Sebhati, A., Shekari, A., & Yazdkhasti, A. (2016). The role of entrepreneurial entrepreneurship training model (KAB) on the entrepreneurial skills of trainees of technical and vocational training centers (Case study: Isfahan province). *Theory and Practice in Curriculum, 4*(7), 31–54. https://doi.org/10.18869/acadpub.cstp.4.7.31

**Publisher’s note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Springer Nature or its licensor (e.g. a society or other partner) holds exclusive rights to this article under a publishing agreement with the author(s) or other rightsholder(s); author self-archiving of the accepted manuscript version of this article is solely governed by the terms of such publishing agreement and applicable law.