



## The Role of Digital Entrepreneurial Self-Efficacy in the Impact of Entrepreneurship Education on Digital Entrepreneurship Performance in Digital Start-ups

Mohammad Sadegh Nikzad<sup>1</sup>, Soodabeh Vafaian<sup>\*2</sup>

1. MSc. Department of Economic Law, Shahid Beheshti University, Tehran, Iran

(Corresponding Author) Email: [Nikzad.1978@yahoo.com](mailto:Nikzad.1978@yahoo.com)

2. MSc. Department of Mass Communication, San Jose State University, California, USA.

*Received:* 19 April 2022

*Revised:* 28 May 2022

*Accepted:* 29 June 2022

### ABSTRACT

This study investigates the role that digital entrepreneurial self-efficacy is likely to play in the effect of entrepreneurship education on digital entrepreneurship performance in digital start-ups. This is an applied research conducted through a descriptive survey using standard questionnaires. The statistical population included all the employees of the digital Start-ups in the city of Tehran who numbered 8231, according to the statistics. Of this population, using Cochran's formula, a sample consisting of 367 was formed ( $n = 367$ ), the individual members of which were selected using simple random sampling. Validity of the questionnaire was assessed and confirmed by the academic experts. Its reliability, as measured in terms of Cronbach's alpha ( $= 0.859$ ), was high and thus, confirmed. The obtained survey data for the test of the research hypotheses were analyzed using SEM-PLS technique. The results indicated that entrepreneurship education had a positive and significant effect on digital entrepreneurial self-efficacy and digital entrepreneurship performance. In addition, digital entrepreneurial self-efficacy was found to have a positive and significant role in enhancing digital entrepreneurship performance.

**KEYWORDS:** Digital entrepreneurial self-efficacy; Entrepreneurial education; Digital entrepreneurship performance; Digital start-ups

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**How to Cite This Article:** Nikzad, M,S; Vafaian, S. (2022). "The Role of Digital Entrepreneurial Self-Efficacy in the Impact of Entrepreneurship Education on Digital Entrepreneurship Performance in Digital Start-ups" , *The Open Access Journal of Resistive Economics*, 10(3): 66-76.

## 1. INTRODUCTION

Entrepreneurship studies have emphasis on entrepreneurial self-efficacy (Hallak et al, 2015). Entrepreneurial self-efficacy refers to an individual's belief in his/her ability in successfully accomplishing entrepreneurial goals. Digital entrepreneurs with a high level of self-efficacy firmly believe in their abilities and minimize their self-doubt that enables them to pursue entrepreneurial opportunities, be more resolute in overcoming failures, and face challenges with more self-confidence (Chen et al, 1998; Hallak et al, 2018). While research shows that entrepreneurial self-efficacy is a powerful method for evaluation of the one's belief in one's abilities in successfully starting an entrepreneurial business, few studies are available in this field (Mauer et al, 2017).

Self-efficacious entrepreneurs set clear and challenging goals, monitor themselves, and make considerable effort to achieve their goals. In fact, self-efficacy is considered the principal constituent of managerial practical techniques such as goal setting and performance feedback (Stroe et al, 2018).

Further, there is evidence that digital businesses can improve themselves through innovation, focusing on quality and reputation building, reducing costs and increasing sales and profits in order to ultimately enhance overall entrepreneurial performance (Ottenbacher & Harrington, 2007). Entrepreneurship education is a field of study that has evolved dramatically over the last three decades (Katz 2008, Sarasvathy & Venkataraman 2011). Not only in law entrepreneurship has grown as a research and academic field, it has also gained broad recognition as an essential activity for the country's competitiveness and economic growth (Makimurto-Kovoma & Puhaka 2013). Entrepreneurship education supports the discovery or creation of new market opportunities for the development of entrepreneurial skills, behaviors, attitudes and thinking in young people. (Krueger, 2007)

Recent studies in entrepreneurship education highlight the lack of theoretical development and educational methods in the field as key issues and propose entrepreneurship education law as a research field (Bergmann, 2016). For instance, Baumol (2010) argued for further testing and government support for research on methods for improvement and promotion of entrepreneurship education as there is little documentation on what works and what does not in entrepreneurship programs. There is little agreement on best practices in entrepreneurship education, especially at the philosophical and pedagogical levels. Researchers suggest that students of entrepreneurship education programs should combine the knowledge of entrepreneurship education and research with the study in order to coordinate the educational content and methods with specific audiences (Kantis 2008). The development of information technology and the Internet has raised motivation in various fields, including entrepreneurship and education. As a result, education has grown rapidly and stimulated the adoption of digital entrepreneurship education, which is a direct consequence of the integration of education and technology recognized as a powerful medium for learning (Al-Farihat et al, 2020).

Entrepreneurship training and networking provide support to aspiring entrepreneurs (Siegel & Phan, 2005). Rauch and Hulsink (2015) show that entrepreneurship education affects entrepreneurial intention directly by using access to resources that facilitate the entrepreneur's work and indirectly by using access to the experience of other entrepreneurs thanks to this education. Lockett, Wright, and Franklin (2003) found that many academics do not need the necessary skills to start a business because these skills are completely different from those they use in their academic life. However, there is little evidence of the effects of entrepreneurship education on the possibilities of academics engagement in the field of entrepreneurship (Miranda, 2017). Therefore, the main research question is whether entrepreneurship

education has a positive and significant effect on digital entrepreneurial self-efficacy and performance of digital entrepreneurship in digital businesses (case study: Digikala digital store)?

## 2. Theoretical framework and research background

Entrepreneurship is the act of being an entrepreneur. This word is derived from the French term *entrepreneurship*, which means the process of creating anything new and valuable, by spending time and effort with the assumption of financial, spiritual and social risks and obtaining financial rewards and personal satisfaction and independence resulting from it (Lounsbury & Glynn, 2011). Entrepreneurship is the skill of discovering an opportunity where others see it as chaotic, contradictory and ambiguous. It is also the ability to establish a team where people can complement each other's skills and talents. Since entrepreneurship is in part acquired, entrepreneurial behavior can be further cultivated in people by using training courses. To this effect, educational programs including entrepreneurial knowledge, skills and mental attitudes should be employed to enable people to cope with work challenges and social problems in the 21st century (Mari et al, 2010). Research shows that the key factor in the shift of entrepreneurship from power to action is the rise in entrepreneurial spirit in people created through education. In this regard, in order to promote entrepreneurship of managers, the International Labor Organization has organized educational and consulting programs called SIYB (Start and Improve Your Business) in different countries. Self-efficacious entrepreneurs focus on opportunities in the environment (Engel et al, 2014) and, therefore, consider unexpected events as a source of opportunity (Sarasvathy & Dew, 2008). Since entrepreneurial decisions are normally ascribed to high self-confidence, self-efficacy is an important prerequisite to entrepreneurial decision-making (Mauer et al, 2017). Having a high level of self-efficacy, digital entrepreneurs believe in their abilities, minimize self-doubt, which enables them to pursue entrepreneurial opportunities, be more persistent in overcoming failure, and have more self-confidence in facing challenges (Chen et al, 1998; Hallak et al, 2018).

Yeh et al (2021), in a research titled *Investigating the relationships between entrepreneurial education and self-efficacy and performance in the context of internet entrepreneurship*, found that entrepreneurship education had a positive effect on digital entrepreneurial self-efficacy, and as a result, it affects the four dimensions of digital entrepreneurship performance (i.e. financial, customer, internal, and learning and growth). Stanzin et al (2020), in a research titled *Entrepreneurial orientation and the mediating role of organizational learning amongst Indian S-SMEs*, noted that learning partially plays a mediating role in the relationship between entrepreneurial intention and performance. Barba-Sánchez and Atienza-Sahuquillo (2018) have investigated entrepreneurial intention and the role of entrepreneurship education among engineering students. Their results indicated the need for independence as a key factor in the entrepreneurial intention of future engineers and confirmed the positive effect of entrepreneurship education on pursuit of their entrepreneurial goals. Olugbola (2017), in a research titled *Exploring entrepreneurial readiness of youth and start-up success components: Entrepreneurship training as a moderator (the case of Universiti Sains Islam Malaysia)*, showed that these success factors had an impact on their entrepreneurship and education lead to an increased capacity in the knowledge-based economy and the student entrepreneurship. The results also suggested that the change of individuals would be permanent. Maresch et al (2016) investigated the impact of entrepreneurship education on the entrepreneurial intention of students in science and engineering versus business studies university programs and showed that entrepreneurship education boosted entrepreneurship.

Hence, based on the research theoretical and empirical background and drawing on the model of Yeh et al (2021), the following conceptual model serves as our point of departure in this study.

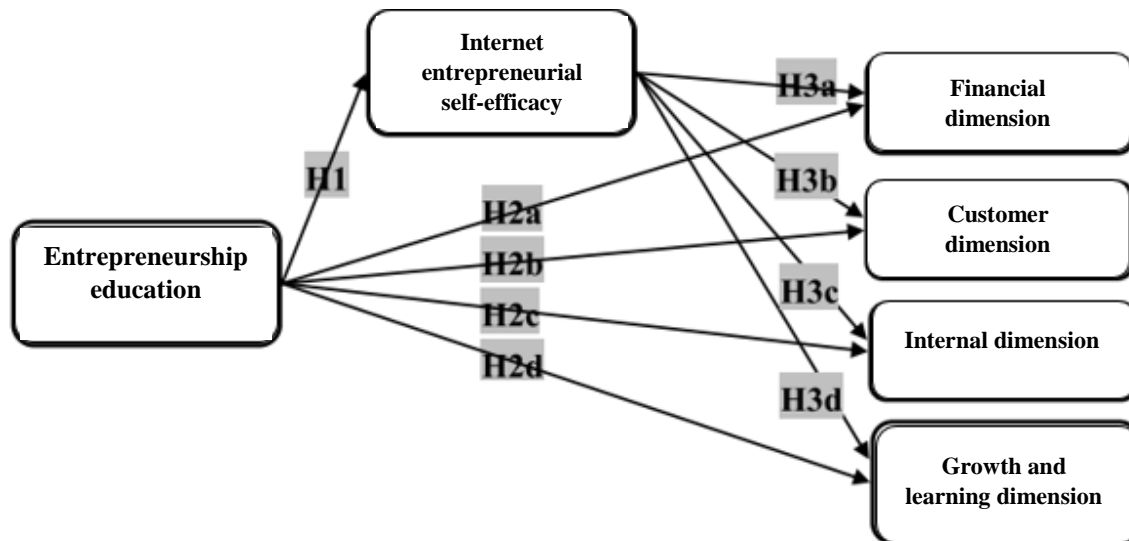


Figure 1. Research conceptual model (Source: Yeh et al, 2021)

**First hypothesis.** Entrepreneurship education has a positive and significant effect on digital entrepreneurial self-efficacy.

**Second hypothesis.** Entrepreneurship education has a positive and significant effect on digital entrepreneurship performance.

**Third hypothesis.** Digital entrepreneurial self-efficacy has a positive and significant effect on digital entrepreneurship performance.

### 3. Methodology

This is an applied research with a quantitative (comparative) approach conducted through a descriptive survey using standard questionnaires.

The statistical population included all the employees of the digital Start-ups in the city of Tehran, numbering 8231, according to the statistics. Of this population, using Cochran's formula, a sample consisting of 367 was formed ( $n = 367$ ), the individual members of which were selected using simple random sampling.

For measurement of the variables, we made use of the standard questionnaire developed by Yeh et al (2021) as detailed in table 1.

Table 1. Features of the research questionnaire

Components	Number of items
Digital entrepreneurship education	5
Digital entrepreneurial self-efficacy	5

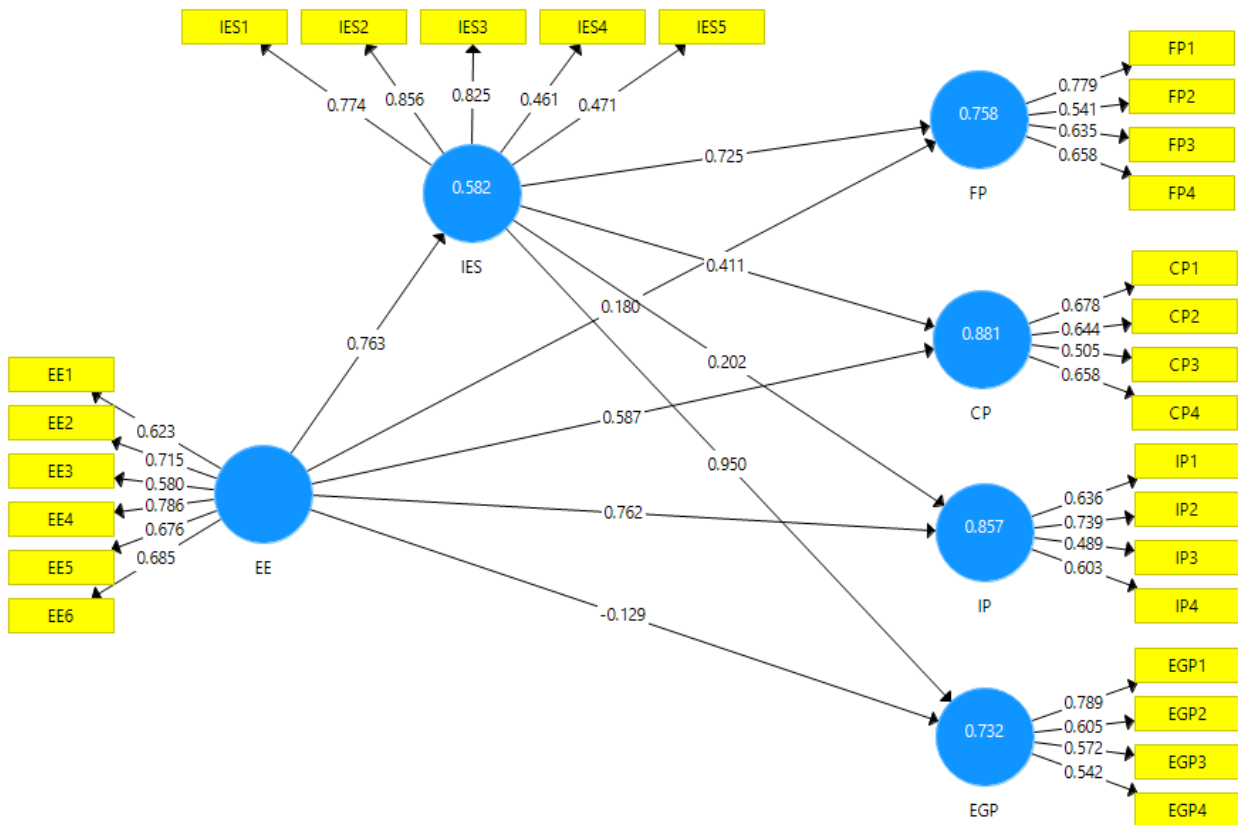
Entrepreneurship performance	Financial dimension	4
	Customer dimension	4
	Internal dimension	4
	Growth & learning dimension	4

The questionnaire was adapted and validated consulting the supervisor and other professors with expertise and knowledge of the field.

A preliminary test of reliability was performed by distributing the questionnaire among 30 respondents, according to which the obtained Cronbach's alpha for all variables of information sharing level and the whole questionnaire was more than 0.7. Next, the obtained data from the whole sample was analyzed in SPSS and the SmartPLS4 software, using structural equation modeling (SEM) technique for PLS.

**4. Findings**

In this section, the results of confirmatory factor analysis of each research variable by SmartPLS 4 are presented. The strength of the relationship between the latent and observable variable is given by the factor loading. Factor loading is a value between zero and one. If the factor loading is less than 0.4, the relationship is considered weak and is ignored. A factor loading between 0.4 and 0.6 is acceptable, and if it is greater than 0.6, it is very desirable (Klein, 2010). The factor loadings of the research variables were calculated separately as shown in figure 2.



**Figure 2.** Factor loadings of model components in standard state

As can be seen in the figure above and table 2, in all the model's constructs, factor loadings have values greater than 0.4. Hence, the reliability of measurement models is acceptable. Having measured the factor loadings of the questions, Cronbach's alphas and composite reliability (Dillon–Goldstein's  $\rho$ ) were computed, the results of which are reported in the table below.

**Table 2.** The results of Cronbach's alpha, composite reliability (CR), and convergent validity

Dimension	CR	Cronbach's alpha	Convergent validity (AVE)
CP	<b>0.717</b>	<b>0.789</b>	<b>0.518</b>
EE	<b>0.837</b>	<b>0.771</b>	<b>0.784</b>
EGP	<b>0.725</b>	<b>0.701</b>	<b>0.768</b>
FP	<b>0.751</b>	<b>0.793</b>	<b>0.714</b>
IES	<b>0.818</b>	<b>0.708</b>	<b>0.528</b>
IP	<b>0.713</b>	<b>0.788</b>	<b>0.658</b>

As is seen in the above table the obtained Cronbach's alpha for all dimensions is greater than the threshold of 0.7, hence the research reliability is confirmed.

To test the composite reliability (CR) of each construct, the Dillon–Goldstein coefficient ( $\rho$ ) is used. The composite reliability reported in table 1 for each construct is greater than the threshold 0.7, hence composite reliability of the constructs are confirmed.

Another criterion in examining the measurement model fit in terms of internal consistency of the constructs is convergent validity which is measured by average variance extracted (AVE). In the table above, the obtained AVE for all constructs is greater than the minimum acceptable value 0.5, whereby the convergent validity of the model is confirmed.

We also use the measure heterotrait-monotrait ratio (HTMT) to assess discriminant validity. If the HTMT value is less than 0.90, there is discriminant validity among the constructs (Henseler et al, 2015).

**Table 3.** Discriminant validity by HTMT

IP	IES	FP	EGP	EE	CP	HTMT
						CP
					<b>0.760</b>	EE
				<b>0.708</b>	<b>0.680</b>	EGP
			<b>0.724</b>	<b>0.979</b>	<b>0.477</b>	FP
		<b>0.713</b>	<b>0.675</b>	<b>0.947</b>	<b>0.453</b>	IES
	<b>0.403</b>	<b>0.685</b>	<b>0.622</b>	<b>0.673</b>	<b>0.803</b>	IP

### Overall model fit

Chen (1998) proposed three values of 0.19, 0.33 and 0.67 as criterion values for weak, moderate and strong  $R^2$  values, respectively, as the indicators of the structural model overall fit.

**Table 4.** R<sup>2</sup> values

Variable	R <sup>2</sup> value	Adjusted R <sup>2</sup> value	Q <sup>2</sup>
CP	0.881	0.880	0.159
EGP	0.732	0.730	0.188
FP	0.758	0.757	0.192
IES	0.582	0.581	0.167
IP	0.857	0.856	0.171

The second structural model fit index is the Q<sup>2</sup> index. This measure indicates the predictive power of the model regarding an endogenous construct. As a rule, Q<sup>2</sup> values of 0.02, 0.15 and 0.35 indicate weak, moderate and strong predictive power corresponding to an exogenous construct, respectively. Given the R<sup>2</sup> and Q<sup>2</sup> values, as reported in table 4, the structural model overall fit and predicting power is confirmed.

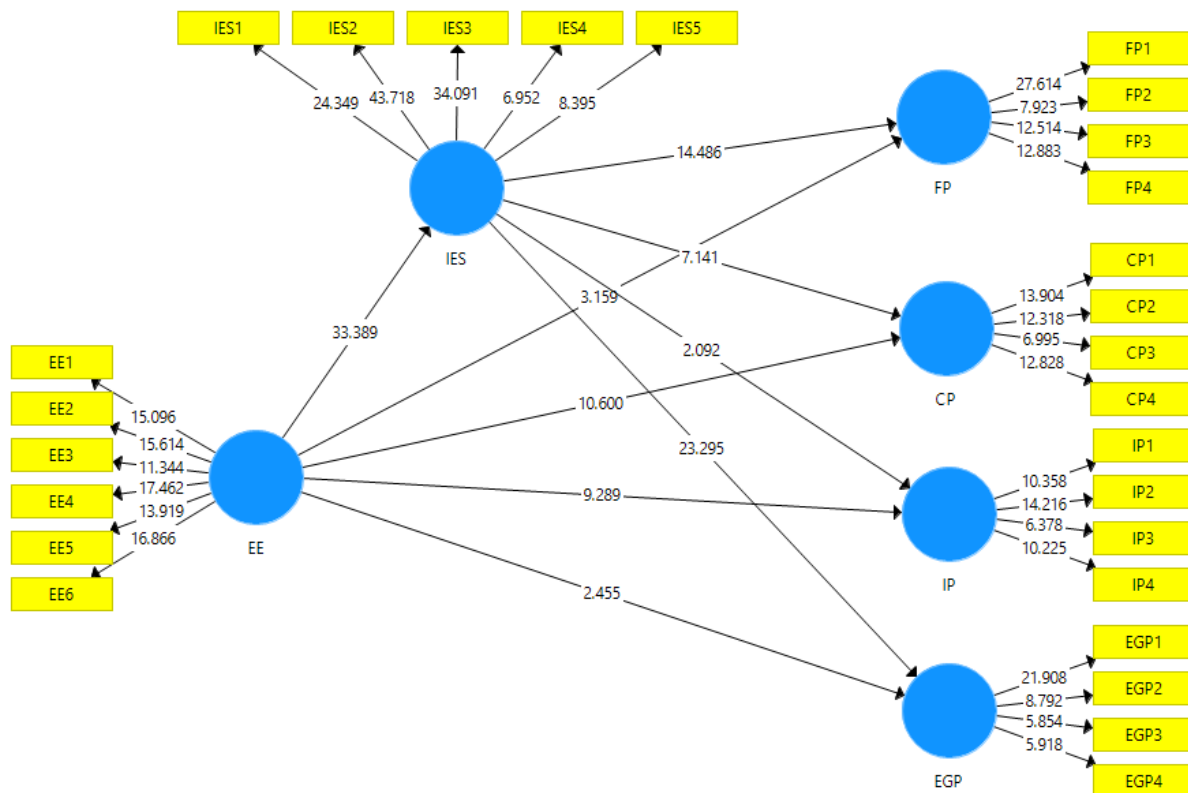
According to Henseler et al (2014), a standardized root mean squared residual (SRMR) value of below 0.1, and in a conservative case, of 0.08, indicates the model adequate overall fit.

**Table 5.** The results on the overall model fit using standardized root mean squared residual (SRMR) and NFI index

Latent variables	Saturated model	Estimated model
SRMR	0.078	0.071
NFI	0.531	0.531
d_ULS	3.468	3.468
d_G	1.597	1.597

The NFI index, which is called the Bentler-Bonnet index, is a comparative fit index. This index assesses the model by comparing the chi-square values of the independent model and the chi-square of the saturated model. An NFI value above 0.9 is acceptable, indicating the model suitability. Bootstrap provides confidence intervals for the two values discrepancy. Values greater than 0.05 for d\_ULS measure (i.e. the Euclidean least square discrepancy) and d\_G (i.e. the geodesic discrepancy) indicate good model fit. The obtained d\_ULS and d\_G values in the above table which are more than 0.05 indicate the model good fit.

By default, PLS4 software tests relationships at the 95% confidence level, and since the t-value at this interval is equal to 1.96, any relationship with a t-value outside the range of -1.96 to +1.96 is considered statistically significant at the 95% confidence interval.



**Figure 3.** Significance coefficients of the conceptual model

The t-statistic shows the significance of the relationship between the variables. A t-value greater than 1.96 indicates a positive and significant effect; a t-value between -1.96 and +1.96 indicates the lack a significant effect; and a t-value smaller than -1.96 indicates a negative and significant effect. Also, if the path coefficients are above 0.6, it means that there is a strong relationship between the two variables; If it is between 0.3 and 0.6, there is a moderate relationship, and if it is below 0.4, there is a weak relationship. As shown in the model, all the hypotheses of the model are confirmed as their t-value falls outside the specified range, indicating the significance of all hypotheses and relationships between variables at the 95% confidence interval. The results on the test of the research hypotheses are presented in the table below.

**Table 6.** Results on the test of the hypotheses

Hypothesis	Path	Path coefficient	p-value	t-value	Test result
1	EE -> CP	0.587	10.600	0.000	Accepted
2	EE -> EGP	0.129	2.455	0.014	Accepted
3	EE -> FP	0.180	3.159	0.002	Accepted
4	EE -> IES	0.763	33.389	0.000	Accepted
5	EE -> IP	0.762	9.289	0.000	Accepted
6	IES -> CP	0.411	7.141	0.000	Accepted
7	IES -> EGP	0.950	23.295	0.000	Accepted
8	IES -> FP	0.725	14.486	0.000	Accepted
9	IES -> IP	0.202	2.092	0.037	Accepted



Given the results in the above table, all the research hypotheses are confirmed.

## 5. Discussion and conclusion

Considering the high capacity of digital businesses in the economic development of the country and the key role of entrepreneurship in the use of these capabilities, as well as the challenges in the limitation of digital entrepreneurship activities and considering the impact of entrepreneurship education and the role of knowledge and entrepreneurial ability in this field, the present study investigated the effect of entrepreneurship education on digital entrepreneurial self-efficacy and entrepreneurship performance in Digikala digital store as the case study. The results showed that entrepreneurship education had a positive and significant effect on entrepreneurship performance. This result is in line with the findings reported by Wibow et al (2018) and Purvana and Shodo (2017). Also, the effect of entrepreneurship education on entrepreneurial self-efficacy was found to be positive and significant, which is consistent with the results documented by Chandra (2018), Baghto et al. (2014), Rasemi (2016), and Ostik et al (2010). The results also confirmed the positive and significant effect of entrepreneurship education on the dimensions of entrepreneurial performance, which are in line with the earlier findings including Barba-Sánchez and Atienza-Sahuquillo (2018), O'Tach (2019), and Aparicio et al (2019). The positive effect of entrepreneurial self-efficacy on digital entrepreneurship found in this study is also in line with the findings of Weibo (2018) and Azizi and Mahmoudi (2018). The above findings suggest that the teachers of entrepreneurship courses, using creative techniques and tools are able to promote entrepreneurial knowledge and practices. Using creative techniques and tools also enables them to improve creative thinking skills. Hence, paying attention to the creativity and innovativeness of instructors in providing digital entrepreneurship training and education is crucial for enhancing entrepreneurial performance and self-efficacy of trainees in the process of transforming them into entrepreneurs. The adoption of a result-oriented digital educational approach by teachers will lead to the planning of targeted digital entrepreneurship educational activities and the flexibility and improvement of entrepreneurship training and education methods. Teachers should consider the two dimensions of entrepreneurial knowledge and self-efficacy by adopting a holistic approach. Adopting this approach, in addition to improving the knowledge of digital entrepreneurship in students, strengthens practical skills and entrepreneurial competencies in them. Therefore, instructors of digital entrepreneurship training courses need to go beyond traditional teaching methods and learn skills such as non-linear thinking.

In line with the knowledge-building purpose of the current research, it should be pointed out that in today's highly competitive environment, countries are trying to take the path of a sustainable economic development by providing contexts for the development of entrepreneurial activities. Therefore, digital entrepreneurship training has become one of the priorities of the governance system. The effectiveness of these policies requires that, in addition to fundamental reforms in the higher education system in line with the development of digital entrepreneurship, the teachers and instructors of entrepreneurship courses need to be equipped with skills and capabilities corresponding to this new environment. As Blimpo (2019) pointed out, the adaptation of the instructors and trainers to this process requires them to have several hardware and software skills, such as using new methods of digital education and designing collaborative processes in digital entrepreneurship education. Their possession of such capabilities enables them to employ creative and up-to-date methods in digital entrepreneurship education in a way that they transform from a mere lecturer to a digital entrepreneurship coach for students (Fury et al, 2019). It also provides the opportunity to develop the trainee's software skills, the skills that have a wide range of consequences

in terms of entrepreneurial knowledge, entrepreneurial action and internal development for students (Azizi and Mahmoudi, 2018).

Finally, by providing digital entrepreneurship education and conducting applied and practical training in workshops and laboratories, universities can identify the strengths and weaknesses, problems and opportunities in order to create new entrepreneurial opportunities and ultimately enhance digital entrepreneurship performance.

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## ACKNOWLEDGMENTS

The current study has not received any grant, fund or contribution from private or government institutions. Also, the authors declare that there is no conflict of interests

## ETHICAL CONSIDERATION

Authenticity of the texts, honesty and fidelity has been observed.

## CONFLICT OF INTEREST

Author/s confirmed no conflict of interest.