Does entrepreneurship education promote vocational students’ entrepreneurial mindset?

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ARTICLE INFO

Keywords:
Education
Entrepreneurship education
Business
Entrepreneurial intention
Entrepreneurial mindset
Vocational students

ABSTRACT

This paper aims to explore how entrepreneurship education determines students’ entrepreneurial intentions as well as examine the emerging role of the entrepreneurial mindset in supporting this relationship. A quantitative method was applied to gain a better understanding of the relationship between variables utilizing Structural Equation Modeling (SEM) based variance Partial Least Square (PLS). The participants of this study were recruited from several vocational students in East Java of Indonesia by using an online survey. The findings indicate that entrepreneurship education positively influences both students’ entrepreneurial intentions and an entrepreneurial mindset. It also reveals a robust correlation between entrepreneurship mindset and students’ entrepreneurship intentions. Lastly, this study’s finding shows that the entrepreneurship mindset has successfully mediated the relationship between entrepreneurial education and students’ entrepreneurial intention.

1. Introduction

The topic of entrepreneurship has received considerable critical attention among scholars over the past decade (Wiklund et al., 2019; Krueger and Brazeal, 2018; Ferreira et al., 2015). Entrepreneurship has become a central issue in both developed and emerging nations as attempts in enhancing the economic welfare of the nation (Wardana et al., 2020; Mathias et al., 2015). Additionally, Doran et al. (2018); Kumar and Raj (2019) revealed that entrepreneurship stimulates the economic growth of countries. It implies that an enhancement of entrepreneurs in a country will drive to the greater of the society welfare and poverty alleviation (Rantanen and Toikko, 2014; Halvarsson et al., 2018; Sutter et al., 2019).

The desirable entrepreneurship has also been felt by such new developed countries as Indonesia. However, compared to other countries, the innumerable entrepreneur in Indonesia is insufficient. Based on the Global Entrepreneurship Index by Acs et al. (2017), Indonesia posits in the rank of 94 from a total of 137 surveyed nations. This achievement is far from neighborhood countries such as Singapore, Brunei Darussalam, and Malaysia. To increase the number of entrepreneurs, the Indonesian government attempts several innovations such as by revitalizing existing curriculum, particularly in the vocational school (Saptono et al., 2020).

The enhancement of entrepreneurship education in vocational school started since implementing the 2013 curriculum and has shown an insignificant result. This is proven by the highest unemployment in Indonesia was dominated by vocational school graduates (Statistics Indonesia, 2020). In more detail, it was lies about 11.4 percent then followed by senior high school with the amount of 8.29 percent. Meanwhile, from the university sides and junior high school, it provided for about 5.18 per cent and 5.54 percent, respectively. Data were taken from the amount released from vocational school graduates, one of which was excluded because of the ineffectiveness of entrepreneurship education (Statistics Indonesia, 2019). Specifically, entrepreneurship education has not shaped the mindset of students for entrepreneurship. In fact, entrepreneurship education is carried out effectively, having an influence on the vocational students’ intention of being entrepreneurs (Ghina et al., 2017; Walter and Block, 2016).

Numerous previous studies on the importance of entrepreneurship have been conducted in Indonesia. For instance, Saptono and Wibowo (2018); Ghina et al. (2017) focused on the features which determine the vocational students’ entrepreneurial intention. Moreover, the prior works concerned of the influence of gender and culture towards intention

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https://doi.org/10.1016/j.heliyon.2020.e05426

Received 22 September 2020; Received in revised form 1 October 2020; Accepted 30 October 2020

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in entrepreneurship (Ana et al., 2016; Buli and Yesuf, 2015). Additionally, some studies have concerned with several factors that are influencing intention, such as family environment (Malach & Kristova, 2017; Wang et al., 2018), big five personality traits (Murugesan & Jayavelu, 2017; Butz et al., 2018), and self-efficacy (Farrukh et al., 2017; Nowinski et al., 2019).

Despite the elevating studies on entrepreneurial research, however, the emerging role of an entrepreneurial mindset associated with entrepreneurship education and entrepreneurship has overlooked by scholars. The existing studies, for instance, Solesvik et al. (2013), revealed that an entrepreneurial mindset could increase student motivation in entrepreneurship. This study provides three contributions. First, this study gives an insight into this growing area by examining the influence of entrepreneurship education and students’ intention to be entrepreneurs. This research also concerns deeply investigating the mediating role of the entrepreneurial mindset. Second, this study focuses on the level of vocational school, while major studies recognize the level of university students. Lastly, the focus study in Indonesia is reasonable since the increasing trend of unemployment from vocational graduates that genuinely proposes being an entrepreneur.

2. Theoretical review

2.1. Entrepreneurship education and entrepreneurial mindset

The entrepreneurial mindset is defined as a feeling or tendency to provide a critical and creative thinking ability (Nabi et al., 2017). The notion of the importance of the entrepreneurial mindset was conveyed by scholars and discussed the idea of an entrepreneurial mindset that is linked to self-competence (Haynie et al., 2010). Additionally, many researchers, for instance, Pfeifer et al. (2016); Zupan et al. (2018), have associated with an entrepreneurial mindset that not only focuses on self-capability but also several factors such as knowledge, experience, creative thinking, problem-solving, seeking opportunities, attitudes, and beliefs.

The entrepreneurial mindset is closely related to the field of psychology, particularly on personality psychology. Solesvik et al. (2013); Westhead and Solesvik (2016) explicitly detail the emergence of an entrepreneurial mindset rooted in personality psychology. The entrepreneurial mindset is linked with the individual’s thinking ability, looking for opportunities instead of obstacles, and offering ideas in overcoming solutions rather than complaints (Naumann, 2017; Davis et al., 2016). Furthermore, Lindberg et al. (2017) underlined that the mindset of entrepreneurship is acquaintance with individual behavior and entrepreneurial activities.

The growing body of literature believes that an entrepreneurial mindset can be boosted by providing entrepreneurship programs through educational perspectives (Cui et al., 2019; Daniel, 2016). The fundamental rationale is that entrepreneurial education allows students to have the capability, understanding, attitude, and motivation related to entrepreneurship. Additionally, Fayolle and Gailly (2015) remarked that entrepreneurship education from all level education promotes two prominent entrepreneurial mindset roles. First, education enables students to create a culture and deeply understand entrepreneurship. Second, entrepreneurial education promotes students to obtain experience to become entrepreneurs. Preliminary studies have also successfully demonstrated the significant influence of entrepreneurship education toward intention of being entrepreneurs. For example, Westhead and Solesvik (2016); Marsesch et al. (2016); Fayolle and Gailly (2015); Shinmar et al. (2018) prove that there is a robust correlation between entrepreneurship education and entrepreneurial intentions.

2.2. Entrepreneurship education and entrepreneurial intention

Education has a vital role in enhancing students’ abilities that promotes business activities. Kim and Park (2019); Nabi et al. (2018) demonstrated that entrepreneurship education has primary functions. First, through entrepreneurship learning activities, it enables a transfer knowledge, information, and experience from learning sources to students. Second, entrepreneurship education through field studies will inspire students to be success person in the future. Westhead and Solesvik (2016); Hasan et al. (2017) revealed that entrepreneurship education can explain students’ intention being entrepreneurs through motivation, skills, social network, and experience.

The entrepreneurship education also exponentially helps individuals to acquire resources through knowledge and information transfer. For instance, when taking entrepreneurial learning, students will have the experience to build an engagement with peers to promote a business (Zeng and Honig, 2016). In addition to have a good experience in entrepreneurship, students will also obtain critical suggestions regarding business activities. Lastly, motivation from peers, business actors, and teachers will help and support entrepreneurial activities. However, entrepreneurship education faces a challenge in its development.

The theory of Ajzen (1991); Shapero (1982) is a basis for explaining how entrepreneurship education affects entrepreneurial intention. The distinguishing element of educational activities will increase the intention to carry out entrepreneurial behavior, or one of the variables that determine that intention (Krueger et al., 2000; Fayolle and Gailly, 2015). Also, Saptono et al. (2020) affirmed that the connectivity between entrepreneurship education and its impact entrepreneurial intentions can be explained by entrepreneurial human capital theory (EHC). Human capital is a subject that plays a crucial role in determining individual entrepreneurial intentions (Khoshnaram et al., 2020). Prasetyo and Kisanti (2020) noted a strong impact between entrepreneurship education and human capital accomplishment.

The role of entrepreneurship education for entrepreneurial intentions can be illustrated by understanding business education. Entrepreneurship education enables students to enhance the awareness and intention of entrepreneurship for a career path to work (Higgins and Refai, 2017), while business education allows students to be a worker in a business firm (White, 2019). The fundamental rationale is that entrepreneurship education focuses on the enhancement of skills, knowledge, and experience toward entrepreneurship. A preliminary study by Davidson (1995) revealed that even though business education is linked with perceived knowledge, however, it not directly affects entrepreneurial intentions. Based on a number of works of literature, we propose a hypothesis that entrepreneurship education has a positive influence on the entrepreneurial intention of vocational students.

H3. Entrepreneurial mindset can influence students’ entrepreneurial intention

H4. Entrepreneurial education can impact entrepreneurial intention through entrepreneurial mindset

3. Materials and method

This study applied a cross-sectional method to comprehensively recognize the impact of the entrepreneurial mindset and entrepreneurship education toward the entrepreneurial intention of vocational students in Indonesia. In more detail, the research framework is illustrated in Figure 1.

3.1. Sample and data collection

The unit analysis of this research was enlisted from several vocational students (SMK) in East Java who have registered in the entrepreneurship education course. The focused study in East Java of Indonesia is reasonable due to the fact that the vocational schools in East Java have more adequate in terms of educational facilities and infrastructure.
instead of other regions in Indonesia. A convenience sample was adopted in this study that frequently applied in the entrepreneurship study (Nowinski et al., 2019). The survey was conducted from January to March 2020, using online forms. A total of 470 questionnaires were received, and after the validating action, approximately 450 questionnaires were verified applicable (see Table 1). The participants in this study were voluntary, and students who engaged in this survey were announced for their anonymity. Ethical approval was established from the Institutional Research Committee of Universitas Negeri Malang for all facet of this study.

Table 1 informs the demographic characteristic of participants Referring to the table, it could be seen that the participant of this survey was vocational students in East Java of Indonesia which ranging in the age of 15–17 years old and it was prevailed by female students. Additionally, the participants have different major field study from office administration, business program and marketing. The preeminent percentage of parents’ occupation was entrepreneur which reach almost 51.11 percent, while the lowest was Soldier and Teacher/Lecturer, with the percentage of approximately, 1.57 percent and 5.55 percent, respectively.

3.2. Instrument development and data analysis

To calculate respondent reaction toward entrepreneurial intention, we followed seven instruments scale from Robledo et al. (2015); Mahfud et al. (2020), while to obtain data on entrepreneurship education, this paper expanded the questionnaires from Denanyoh et al. (2015); Buli and Yesuf (2015) that consisting of six item questions. Lastly, the entrepreneurial mindset was measured using seven items of instruments from Mathisen and Arnulf (2013); Cui et al. (2019). In more precisely, the instruments to measure all variables were provided in Table 2. Each construct of variable was calculated undergoing the five-point Likert Scale ranging from “strongly disagree” (1) to “strongly agree” (5). The data were calculated utilizing Partial Least Square (PLS) approach to Structural Equation Modelling (SEM). The calculation and judgment of a Partial Least Square (PLS) model in this study was provided in two stages: First, the assessment of validity and reliability of the construct to determine the goodness of measures. Second, the evaluation of structural model to evaluate the hypotheses under research.

4. Results and discussion

4.1. Assessment of outer model

First, we calculated the outer model evaluation using four component: convergent validity, discriminant validity, composite reliability, and construct reliability. Table 2 provides information about the result of the outer model assessment. From Table 2, it can be presented that all variables, which consisting of entrepreneurship education (EE), entrepreneurial mindset (EM), and entrepreneurial intention (EI), have a loading score ranging between 0.712 to 0.904. These results showed that the variables had met the criteria of convergent validity (loading factor ≥0.70) (Chin, 2009; Hair et al., 2013). However, the convergent validity test results of the entrepreneurial mindset variable show that we found one item (EM7) has to be discarded from the seven indicators provided since it has a loading factor value below 0.70. Furthermore, from the table, it can be seen that the AVE score for all construct is greater than 0.5, which implies that these variables have satisfied the discriminant validity criteria.

Table 2 also illustrates that all variables, including entrepreneurial education, entrepreneurial mindset, and entrepreneurial intention have the CR value of 0.950, 0.920, and 0.936, respectively (≥0.70), meaning that the variables have confirmed the composite reliability formula (Chin, 2009; Hair et al., 2013). Accordingly, Cronbach Alpha (α) value of entrepreneurial education, entrepreneurial mindset, and entrepreneurial intention were 0.937, 0.895, 0.915 (≥0.70), which means that these variables have satisfied the composite reliability. Furthermore, the AVE score from the variables is ranging from 0.658 to 0.7589 (≥0.50), which has fulfilled the discriminant validity test (Chin, 2009; Hair et al., 2013).

The discriminant calculation is also reinforced in Table 3. From the table, it can be illustrated that the value of cross-loading for entrepreneurial education, entrepreneurial mindset, and entrepreneurial intention is upper 0.70, which indicated that the variables had satisfied the convergent validity criteria (Chin, 2009; Hair et al., 2013).

Apart from using the Fornell and Larcker (1981) model and cross-loading (Chin, 2009), we also applied a heterotrait-monotrait ratio procedure by Henseler et al. (2015) to estimate the discriminant validity. The test results for each variable (see Table 4) showed that the heterotrait-monotrait ratio is less than 0.90, which implies that the variables have satisfied the discriminant validity (Henseler et al., 2015).

4.2. Assessment of inner model

After evaluating the outer model assessment, we further calculate the inner model assessment for the structural model evaluation. In this study, we followed five stages of the test, including testing of collinearity, path coefficient, the level of R-Square, the effect size, and the relevant predictions (Q2).

4.2.1. Collinearity test

Collinearity test is conducted to see whether high collinearity occurs between variables or not. The collinearity test is determined undergoing
Variance Inflation Factor (VIF) coefficient with the criteria of VIF value should be lower than 5.00 (Hair et al., 2013). Based on the previous calculation, all variables under study has a VIF coefficient value in the range 1.675–3.396 (<5.00), so there is no colinearity for this construct. Thus, all indicators of the constructs tested are valid.

### 4.2.2. R-square (R2)

R-Square (R²) test is aimed at understanding the endogenous latent variable has predictive power to the model or not. In summary, the R² value shows the strength of the prediction accuracy (Hair et al., 2013). As for the rule of R², the values of 0.67, 0.33, and 0.19 disclose that the model is strong, moderate, and weak (Chin, 2009). The test results showed that the R-square of entrepreneurial mindset variable is 0.583, which means that the entrepreneurial education variable can explain 58.3 percent of the entrepreneurial mindset's variant with a moderate predictive level. Furthermore, the R² value of the entrepreneurial intention variable is 0.676, which means that 60.6 percent of entrepreneurial intention variants could be described by the entrepreneurial education and entrepreneurial mindset variables with a solid predictive level.

### 4.2.3. The size effect test (f²)

The size effect test (f²) aims to evaluate the extent of the correlation of the latent predictor variable (exogenous latent variable) on the structural model (Hair et al., 2013). Accordingly, there are three main criteria, which are 0.02 (small), 0.15 (medium, and 0.35 (large) The prior calculation shows that the entrepreneurial mindset's f2 value on an entrepreneurial mindset is 1.34, which indicates a large effect size. Furthermore, the value of f2 entrepreneurial education and entrepreneurial mindset on entrepreneurial intention is 0.39, which shows a large effect size.

### 4.2.4. Relevant prediction test (Q2)

The relevant prediction test aims to determine how degree the model's noticed value and its parameter estimates. The score of Q² > 0 (zero) reveals that the model has a a good predictive relevance value and vice versa. The formula used is as follows: $Q^2 = 1 - (1-R^2)$. Following the preliminary test, it can be seen that the Q² score of each variable is greater than zero, thus illustrating that the model of this study has a predictive relevance value.

### 4.2.5. Path analysis

Path coefficients aim to evaluate structural models. Furthermore, in PLS-SEM, to obtain the t-statistic or t-value, a bootstrap resampling procedure is used. The bootstrapping criteria is a non-parametric approach to testing PLS-SEM testing's accuracy/precision (Henseler et al., 2009). The results of the bootstrapping show the stability of the PLS-SEM test. The data were processed in this research used 500 bootstrapped samples. Table 5 and Figure 2 indicate that the path coefficient (p-value) of the four relationships among variables is 0.000 < 0.05.

### 5. Discussion

This study proposed four hypotheses, and this paper attempts to elucidate the relationship between variables in detail. The initial project of this study aims to confirm that entrepreneurship education in the vocational school can explain students' entrepreneurial intention. The statistical calculation indicated that the first hypothesis has the t-value of 9.410, which implies that entrepreneurship education successfully drives students' intention of being entrepreneurs. The fundamental rationale of this finding is that the entrepreneurship education model has provided inspiration, transfer knowledge, and resource availability for students. Additionally, entrepreneurship education enables students to obtain

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**Table 2. Results of outer model measurement.**

| Code | Variable/Indicator                                                                 | EE   | EM   | EI   | Loading | CR  | α   | AVE  |
|------|-----------------------------------------------------------------------------------|------|------|------|---------|-----|-----|------|
| EE1  | The entrepreneurial education model in the formal setting promotes the creative ideas | 0.849|      |      |         |     |     |      |
| EE2  | The learning model in the classroom provides the required knowledge toward entrepreneurship, | 0.896|      |      |         |     |     |      |
| EE3  | The education in school drives skill and ability related to entrepreneurship         | 0.858|      |      |         |     |     |      |
| EM1  | I have thought from both sides (opportunities or challenges) reactions incorporating with the entrepreneurial activities. | 0.847|      |      |         |     |     |      |
| EM2  | I have seen time allocation for entrepreneurial matters.                           | 0.791|      |      |         |     |     |      |
| EM3  | I have deliberated the financial chances to be engaged in the entrepreneurial activities. | 0.826|      |      |         |     |     |      |
| EM4  | I have evaluated for both opportunities and challenges linked with entrepreneurial activities. | 0.855|      |      |         |     |     |      |
| EM5  | I have decided toward ideas for business opportunity in the entrepreneurial activities. | 0.826|      |      |         |     |     |      |
| EM6  | I have disserted whether it is beneficial for me to be engaged in the entrepreneurial activities. | 0.712|      |      |         |     |     |      |
| EI1  | I will be ready to do my best to be an entrepreneur in the near future              |      | 0.861|      |         |     |     |      |
| EI2  | I will do every attempt to begin and manage my own venture                         |      | 0.871|      |         |     |     |      |
| EI3  | I will initiate to open a business in the near future                               |      | 0.865|      |         |     |     |      |
| EI5  | My final objective is to be an entrepreneur                                        |      | 0.860|      |         |     |     |      |
| EI6  | I will do my best to achieve my goal to be an entrepreneur                          |      | 0.859|      |         |     |     |      |

Note: EE = entrepreneurial education; EM = entrepreneurial mindset; EI = entrepreneurial intention.

**Table 3. Discriminant validity.**

|   | EE | EM | EI |
|---|----|----|----|
| EE | 0.871|    |    |
| EM | 0.754| 0.811|    |
| EI | 0.760| 0.702| 0.811|

**Table 4. Heterotrait-monotrait ratio.**

|   | EE | EI | EM |
|---|----|----|----|
| EE |    | 0.807|    |
| EI | 0.824|    | 0.766|
information and experience on how to initiate and run a new venture. In more specific, the entrepreneurship education provided answers several provided questions such as what motivations for being entrepreneurs, what should students do and effort for being an entrepreneur, what skills or capability that students need to become entrepreneurs, and how to elaborate related to marketing the business. In addition to entrepreneurship education, it allows students to have a great experience that help them for being entrepreneurs in the future. The entrepreneurship education in the school authorizes students to interact with either peers or successful figures in solving issues in the entrepreneurial studies. Additionally, students can also receive comments regarding to their entrepreneurial activities whilst joining in the entrepreneurship course. Motivation from peers and teachers also support for their intention to be entrepreneurs whilst joining in the entrepreneurship course. The entrepreneurial education provided several answers such as what motivations for being entrepreneurs, what should students do and effort for being an entrepreneur, what skills or capability that students need to become entrepreneurs, and how to elaborate related to marketing the business. In addition to entrepreneurship education, it allows students to have a great experience that help them for being entrepreneurs in the future. The entrepreneurship education in the school authorizes students to interact with either peers or successful figures in solving issues in the entrepreneurial studies. Additionally, students can also receive comments regarding to their entrepreneurial activities whilst joining in the entrepreneurship course.

Entrepreneurial education, which in turn affects to their behavior. The entrepreneurial mindset is linked with the individual's initial knowledge and interactions with the current environment. The entrepreneurial mindset can be determined and learned through investigating how factors in entrepreneurial education and its role in driving intention of being entrepreneurs.

In addition to entrepreneurial intention, this study confirmed that entrepreneurship education acts a fundamental role in determining students' mindset on entrepreneurship. Based on the prior analysis, it can be informed that the t-value is about 29.555, which implies that the second hypothesis is accepted. This finding supports a strong correlation within entrepreneurship education and entrepreneurial mindset that has been reported by Solesvik et al. (2013); Westhead and Solesvik (2016); Maresch et al. (2016); Shinar et al. (2018); on the importance of entrepreneurship education and its role in driving intention of being entrepreneurs.

The last finding of this study indicated that entrepreneurial mindset mediates the correlation between entrepreneurship education and entrepreneurial intention and also corresponds to that if there are positive and direct relationship within these variables, one of them might have the potential to mediate among variables. This result supports some previous studies by Béchard and Grégoire (2005) and Gibb (2002), which stated that the mindset is formed from entrepreneurship education and its activities in the school, which in turn affects to their behavior. Additionally, Winkler (2014) and Cui et al. (2019) have elaborated the social cognitive theory for entrepreneurship education and developing a dynamic foundation for research related to the impact of entrepreneurship education that contributes to investigating how factors in entrepreneurship education drives cognitive of students and subsequent entrepreneurial intentions. These results also support several prior studies by Béchard and Grégoire (2005) and Gibb (2002), which stated that the mindset is formed from entrepreneurship education and its activities in the school, which in turn affects to their behavior.

The last finding of this study indicated that entrepreneurial mindset mediates the correlation between entrepreneurship education and entrepreneurial intention and also corresponds to that if there are positive and direct relationship within these variables, one of them might have the potential to mediate among variables (Baron and Kenny (1986). Learning activities or experiences influence cognitive factors such as entrepreneurial mindset, entrepreneurial inspiration, motivation, self-efficacy, and entrepreneurial intentions. According to Cui (2020), the entrepreneurial mindset can be determined and learned through individual initial knowledge and interactions with the current environment. The entrepreneurial mindset is linked with the individual's thinking ability, looking for opportunities instead of obstacles, and offering ideas in overcoming solutions rather than complaints (Naumann, 2017; Davis et al., 2016). This result supports some previous studies by Hussain and Norashidah (2015); Walter and Block (2016) that the entrepreneurial mindset mediates the influence of entrepreneurship education on the entrepreneurial intentions of vocational school students.
6. Conclusion and recommendation

This study is purposed to evaluate the influence of entrepreneurial education and entrepreneurial mindset on vocational students’ entrepreneurial intentions in Indonesia. From this research, it could be concluded that entrepreneurship education positively leads to students’ entrepreneurial intention and an entrepreneurial mindset. Indeed, this study confirmed a vigorous connectivity between entrepreneurial mindset and vocational students’ entrepreneurial intentions. Lastly, it can be known that entrepreneurship education positively drives vocational students’ entrepreneurial intentions through the entrepreneurial mindset. This study highlighted that teacher should enhance their competence, particularly related to entrepreneurship, such as entrepreneurship webinars, in-house training, and certification program. Additionally, schools’ principals can boost teachers to continue their studies for greater performance. The entrepreneurship curriculum in Indonesia should also be enhanced so that it can form entrepreneurial competencies and foster student enthusiasm for entrepreneurship. Furthermore, entrepreneurship education in schools should encourage students to develop creative ideas to become entrepreneurs. Entrepreneurship education should also provide the needed knowledge about entrepreneurship, continuing to encourage and develop students to be ready to become entrepreneurs. The limitation of this work is that the participants of this study were generated solely from the state vocational schools in East Java of Indonesia using convenience sampling. Therefore, further researchers that are concerned about entrepreneurship education is suggested to elaborate also both private and state vocational schools across the country and enlarge the sample area employing stratified random sampling that make this finding could be generalized. Further investigation also needs to engage a mixed method to gain in detail the dominant and distinctive factors that affect the students’ entrepreneurial mindset of vocational schools in East Java in particular, and Indonesia as well.

Declarations

Author contribution statement

P. Handayati: Conceived and designed the experiments; Wrote the paper.
B. E. Soetjipto: Conceived and designed the experiments; Analyzed and interpreted the data.
A. Wibowo: Performed the experiments; Contributed reagents, materials, analysis tools or data.
B. S. Narmaditya: Contributed reagents, materials, analysis tools or data; Wrote the paper.

Funding statement

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of interests statement

The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

References

Acs, Z., Szerb, L., Autio, E., 2017. The global entrepreneurship index. In: Global Entrepreneurship and Development Index 2016. Springer, Cham, pp. 19–38.
Ajzen, I., 1991. The theory of planned behavior. Organ. Behav. Hum. Decis. Process. 50, 179–211.
Ana, A., Hurriyati, R., Rostika, Y., Nazeri, M., 2016. Entrepreneurial intentions of tourism vocational high school students in Indonesia and Malaysia. J. Tech. Educ. Training UTET 8 (2), 12–20.
Bandara, A., 2001. Social cognitive theory: an agentive perspective. Annu. Rev. Psychol. 52, 1–26.
Baron, R.M., Kenny, D.A., 1986. The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations. Buli, B.M., Yusuf, W.M., 2015. Determinants of entrepreneurial intentions: technical-vocational education and training students in Ethiopia. Edu. Train. 57, 891–907.
Béchard, J.P., Grigorie, D., 2005. Entrepreneurship education research revisited: The case of higher education. Acad. Manage. Learn. Educ. 4 (1), 22–42.
Butz, N.T., Hansson, S., Schultz, P.L., Warzyzynski, M.M., 2018. Beyond the Big Five: does grit influence the entrepreneurial intent of university students in the US? J. Global Bus. Educ. 8 (1), 1–16.
Chin, W.W., 2009. How to write up and report PLS analyses. Handbook of Partial Least Squares 655–690.
Cui, J., Sun, J., Bell, R., 2019. The impact of entrepreneurship education on the entrepreneurial mindset of college students in China: the mediating role of inspiration and the role of educational attributes. Int. J. Manag. Educ. 100296.
Daniel, A.D., 2016. Fostering an entrepreneurial mindset by using a design thinking approach in entrepreneurship education. Ind. High. Educ. 30 (3), 215–223.
Davis, M.H., Hall, J.A., Mayer, P.S., 2016. Developing a new measure of entrepreneurial mindset: reliability, validity, and implications for practitioners. Consult. Psychol. J. Pract. Res. 68 (1), 1–28.
Davidsson, P., 1995. Culture, structure and regional levels of entrepreneurship. Eur. Union. Reg. Dev. 7 (1), 41–62.
Denayon, R., Adjei, K., Nyemekye, G.E., 2015. Factors that impact on entrepreneurial intention of tertiary students in Ghana. Int. J. Bus. Soc. Res. 5 (3), 19–29.
Doran, J., McCartney, N., O’Conner, M., 2018. The role of entrepreneurship in stimulating economic growth in developed and developing countries. Cogent Economics & Finance 1 (1), 1442093.
Farrukh, M., Khan, A.A., Khan, M.S., Ramzani, S.R., Soladoye, B.S.A., 2017. Entrepreneurial intentions: the role of family factors, personality traits and self-effeciveness. World J. Entrepreneurship, Manag. Sustain. Dev. 9 (6), 1265–1272.
Fayolle, A., Gaill, B., 2015. The impact of entrepreneurship education on entrepreneurial attitudes and intention: hysteresis and persistence. J. Small Bus. Manag. 53 (1), 75–93.
Ferreira, M.P., Reis, N.R., Miranda, R., 2015. Thirty years of entrepreneurship research published in top journals: analysis of citations, co-citations and themes. J. Global Entrepreneurship Res. 5 (1), 1–22.
Fornell, C., Larcker, D.F., 1981. Evaluating structural equation models with unobservable variables and measurement error. J. Market. Res. 18 (1), 39–50.
Ghina, A., Simanampum, T.M., Gustomo, A., 2017. The relevancy of graduates’ competencies to the effectiveness of entrepreneurship education: a case study at SIBM ITB-Indonesia. J. Enterpren. Educ. 20 (1), 1–24.
Gibb, A., 2002. Creating conducive environments for learning and entrepreneurship: living with, dealing with, creating and enjoying uncertainty and complexity. Industry and Higher Education 16 (3), 135–148.
Hair, J.F., Ringle, C.M., Sarstedt, M., 2013. Partial least squares structural equation modeling: rigorous applications, better results and higher acceptance. Long. Range Plan. 46 (1–2), 1–12.
Hussain, A., Narashidah, D., 2015. Impact of entrepreneurship education on entrepreneurial intentions of Pakistani Students. J. Enr. Bus. Innov. 2 (1), 43–53.
Huyton, D., Korpi, M., Wennberg, K., 2018. Entrepreneurship and income inequality. J. Econ. Behav. Organ. 145, 275–293.
Hasan, S.M., Khan, E.A., Nabi, M.N.U., 2017. Entrepreneurial education at university level and entrepreneurship development. Educ + Train 59 (7/8), 888–906.
Haynie, J.M., Shepherd, D., Mosakowski, E., Earley, P.C., 2018. A situated metacognitive model of the entrepreneurial mindset. J. Bus. Ventur. 25 (2), 217–229.
Henseler, J., Ringle, C.M., Sarstedt, M., 2015. A new criterion for assessing discriminant validity in variance-based structural equation modeling. J. Acad. Market. Sci. 43 (1), 115–135.
Henseler, J., Ringle, C.M., Sinkovics, R.R., 2009. The use of partial least squares path modeling in international marketing. In: New challenges to international marketing. Emerald Group Publishing Limited.
Higgins, D., Refai, D., 2017. Creating meaningful entrepreneurial practice: crafting pedagogical awareness. Entrepreneurship Education. Emerald Publishing Limited.
Khoshrumam, M., Shiri, N., Shinmar, R.S., Savid, M., 2020. Environmental support and entrepreneurial behavior among Iranian farmers: the mediating roles of social and personal capital. J. Small Bus. Manag. 1–25.
Kim, M., Park, M.J., 2019. Entrepreneurial education program motivations in shaping engineering students’ entrepreneurial intention. J. Entrepreneurship Emerging Econom. 11 (3), 328–350.
Krueger, N.F., Brazed, D.V., 2018. Entrepreneurial potential and potential entrepreneur. PREEFE - Revista de Emprendedoreismo e Gestão de Pequenas Empresas 7 (2), 201–226.
Krueger, N.F., Reilly, M., Carnaud, A., 2000. Competing models of entrepreneurial intentions. J. Bus. Ventur. 15, 411–432.
Kumar, R., Raj, T., 2019. Role of entrepreneurship in boosting economic growth and employment in India. Small Enterp. Dev. Manag. Extension J. 46 (4), 273–281.
Lindberg, E., Bohman, H., Holen, P., Wilson, T., 2017. Enhancing students’ entrepreneurial mindset: a Swedish experience. Educ + Train 59 (7/8), 68–77.
Mahfud, T., Triyon, M.B., Sudira, P., Mulyani, V., 2020. The influence of social capital and entrepreneurial attitude orientation on entrepreneurial intentions: the mediating role of psychological capital. Educ. Res. Manag. Business Econ. 26 (1), 33–39.
Mareisch, D., Harms, R., Kailer, N., Wimmer-Wurm, B., 2016. The impact of entrepreneurship education on the entrepreneurial intention of students in science
and engineering versus business studies university programs. Technol. Forecast. Soc. Change 104, 172–179.

Mathias, B.D., Williams, D.W., Smith, A.R., 2015. Entrepreneurial inception: the role of imprinting in entrepreneurial action. J. Bus. Ventur. 30 (1), 11–28.

Mathisen, J.E., Arnulf, J.K., 2013. Competing mindsets in entrepreneurship: the cost of doubt. Int. J. Manag. Educ. 11 (3), 132–141.

Malach, J., Kristova, K., 2017. The impact of school education and family environment on pupils’ entrepreneurial spirit and attitude to entrepreneurship. New Educ. Rev. 49 (3), 101–114.

Murugesan, R., Jayavelu, R., 2017. The influence of big five personality traits and self-efficacy on entrepreneurial intentions: the role of gender. J. Entrepren. Innovation Emerg. Econom. 3 (1), 41–61.

Nowinski, W., Haddoud, M.Y., Lancaric, D., Egerova, D., Czegledi, C., 2019. The impact of entrepreneurship education, entrepreneurial self-efficacy and gender on entrepreneurial intentions of university students in the Visegrad countries. Stud. High. Educ. 44 (2), 361–379.

Nabi, G., Linan, F., Fayolle, A., Krueger, N., Walmsley, A., 2017. The impact of entrepreneurship education in higher education: A systematic review and research agenda. Acad. Manage. Learn. Educ. 16 (2), 277–299.

Nabi, G., Walmsley, A., Lišán, F., Akhtar, I., Neame, C., 2018. Does entrepreneurship education in the first year of higher education develop entrepreneurial intentions? The role of learning and inspiration. Stud. High Educ. 43 (3), 452–467.

Naumann, C., 2017. Entrepreneurial mindset: a synthetic literature review. Entrepren. Bus. Econom. Rev. 5 (3), 149–172.

Pfeifer, S., Sarlija, N., Žekić Sušac, M., 2016. Shaping the entrepreneurial mindset: entrepreneurial intentions of business students in Croatia. J. Small Bus. Manag. 54 (1), 102–117.

Praetvy, P.E., Kistanti, N.R., 2020. Human capital, institutional entrepreneurship and entrepreneurship as a driver for quality & sustainable economic growth. Entrepreneurship Sustain. Issues 7 (4), 2575–2589.

Rantane, T., Toikko, T., 2014. Entrepreneurship, social welfare, and cultural values: young peoples social attitudes in Finland. Adv. Business-Related Sci. Res. J. 5 (1), 15–24.

Robledo, J.L.R., Arán, M.V., Sanchez, V.M., Molina, M.A.R., 2015. The moderating role of gender on entrepreneurial intentions: a TPB perspective. Intang. Cap. 11 (1), 92–117.

Saptono, A., Wibowo, A., 2018. Do learning environment and self-efficacy impact on students entrepreneurial attitude? Int. J. Entrepren. 22 (4), 1–11.

Saptono, A., Wibowo, A., Narmaditya, B.S., Karyaningih, R.P.D., Yanto, H., 2020. Does entrepreneurial education matter for Indonesian students’ entrepreneurial preparation: the mediating role of entrepreneurial mindset and knowledge. Coget Edu. 7 (1), 1830728.

Shapero, A., 1982. Social dimensions of entrepreneurship. In: Kent, C., Sexton, D., Vesper, K. (Eds.), The Encyclopedia of Entrepreneurship. Prentice-Hall, Englewood Cliffs, NJ, pp. 72–90.

Shinnar, R.S., Hou, D.K., Powell, B.C., Zhou, H., 2018. Entrepreneurial intentions and start-ups: are women or men more likely to enact their intentions? Int. Small Bus. J. 36 (1), 60–80.

Solesvik, M.Z., Westhead, P., Matlay, H., Panyak, V.N., 2013. Entrepreneurial assets and mindsets’ benefit from university entrepreneurship education investment. Educ + Train 55, 748–762.

Statistics Indonesia, 2020. Keadaan Ketenagakerjaan Indonesia Agustus 2020. Badan Pusat Statistik, Jakarta.

Sutter, C., Bruton, G.D., Chen, J., 2019. Entrepreneurship as a solution to extreme poverty: a review and future research directions. J. Bus. Ventur. 34 (1), 197–214.

Wang, D., Wang, L., Chen, L., 2018. Unlocking the influence of family business exposure on entrepreneurial intentions. Intn. Entren. Manage. J. 14 (4), 951–974.

Walter, S.G., Block, J.H., 2016. Outcomes of entrepreneurship education: an institutional perspective. J. Bus. Ventur. 31 (2), 216–233.

Wardana, L.W., Narmaditya, B.S., Wibowo, A., Mahendra, A.M., Wibowo, N.A., Harwida, G., Rohman, A.N., 2020. The impact of entrepreneurship education and students’ entrepreneurial mindset: the mediating role of attitude and self-efficacy. Heliyon 6 (9), e04922.

Westhead, P., Solesvik, M.Z., 2016. Entrepreneurship education and entrepreneurial intention: do female students benefit? Int. Small Bus. J. 34 (8), 979–1003.

White, J., 2019. Transforming purpose-driven business education. Humanistic Manag. J. 4 (2), 261–264.

Winkler, C., 2014. Toward a dynamic understanding of entrepreneurship education research across the campus–social cognition and action research. Entnr. Res. J. 4 (1), 69–93.

Wiklund, J., Nikolaev, B., Shir, N., Foo, M.D., Bradley, S., 2019. Entrepreneurship and well-being: past, present, and future. J. Bus. Ventur. 34 (4), 579–588.

Zeng, Z.E., Honig, B., 2016. How should entrepreneurship be taught to students with diverse experience? A set of conceptual models of entrepreneurship education. In: Models of Start-Up Thinking and Action: Theoretical, Empirical and Pedagogical Approaches. Emerald Group Publishing Limited.

Zupan, B., Čankar, F., Setnikar Čankar, S., 2018. The development of an entrepreneurial mindset in primary education. Eur. J. Educ. 53 (3), 427–439.