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An exploratory factor analysis of entrepreneurship psychological readiness (EPR) instrument

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Abstract

The purpose of this study was to develop an instrument for assessing psychological readiness for entrepreneurship. A well-designed measurement of entrepreneurship psychological readiness can provide early warning to policymakers, in this case the government, and provide education and funding to prospective entrepreneurs who must not only be examined physically, but also psychologically. Using Exploratory Factor Analysis (EFA) and reliability analysis, the validity and reliability of the Entrepreneurship Psychological Readiness (EPR) instrument were examined. An Exploratory Factor Analysis (EFA) found that the Entrepreneurship Psychological Readiness (EPR) instrument's eight-factor model explained 57.44% of the variance among the items. To develop a fit model, it was necessary to exclude 26 items from the questionnaire, leaving 59 items left. The factors name identified by Personal Knowledge, Personal Adversity, Committed Certain Action, Willingness to Learn, Personal Relationship to Others, Personal Growth, Passion Achieved, and Related Person Support. All of the eight-factor models have excellent reliability of 0.96.

Keywords: Entrepreneurship, Entrepreneurial measurement, Factor analysis, Instrument development, Policy making, Psychological readiness

Introduction

The number of entrepreneurs in Indonesia has yet to exceed 4%. The Central Bureau of Statistics (2020) career choices based on the primary category of work in 2020 indicate that entrepreneurship remains at 38.84% compared to other types of work. According to the Ministry of Cooperatives and MSMEs (2020), the proportion of entrepreneurs in Indonesia's population of approximately 270 million is still 3.47%. It is even relatively low compared to other ASEAN nations, such as Singapore, where the percentage of MSMEs is 8.76%, 4.26% in Thailand, and 4.74% in Malaysia, based on the total population of these nations.

The UN member nations, including Indonesia, have as one of their goals advancing an agenda based on the Sustainable Development Goals (SDGs). The task of offering a framework for shifting growth paths across sustainable development is central to the objectives of the 2030 Agenda. This agenda's implementation aims to support national

sustainable development initiatives, build on current planning tools, and emphasize the value of creating policy frameworks. One of its goals is to encourage young entrepreneurs and promote youths with relevant talents, such as technical and vocational ones (Salazar-Xirinachs, 2012).

The quality of entrepreneurship and how ecosystems are utilized to promote these activities are both covered by the Global Entrepreneurship Index (GEI). In their study, they identified 14 critical factors that must be taken into account when determining readiness for entrepreneurship. Of these 14 critical GEI factors, Indonesia is reported to have witnessed a fall in GEI scores from 2017 by 21.1% to 21.0 in 2018. According to the GEI research, it is also known that Indonesia ranks quite poorly in terms of preparation compared to the other ASEAN nations. In Indonesia, research on the intention to start a business has so far been done from the social, cultural, and economic perspectives of the locals. Student entrepreneurship tendency is significantly impacted by psychological and social factors (Rokhman & Ahamed, 2015). Entrepreneurship is a concept that encompasses a variety of activities that are influenced by various government policies. As a result, developing an entrepreneurship generally necessitates stable economic growth, market adaptability, labor availability, and government policies that take sides (Kukoc & Regan, 2008). How do some people decide to become entrepreneurs, while others choose not to even attempt it is one of the topics that some researchers are trying to answer. An individual's ability as an entrepreneur is to be able to see and understand the knowledge he has acquired as a learning system (Coduras et al., 2016; Douglas, 2009).

Previous research has demonstrated that cognitive conditions may affect entrepreneurial attitudes and goals (Amofah, et al., 2020). To explain the psychological aspects of entrepreneurship, the theory of psychological readiness is one of the most critical determinants of self-fulfillment in selecting a vocation as a professional entrepreneur (Uhryn, 2020). Our preliminary research indicates that entrepreneurial psychological readiness predicts the formation of new entrepreneurs. Young graduates are encouraged to become entrepreneurs as the current economic hope for the country, which, if adequately supported, can result in robust economic development (Altinay, 2008).

For the following reasons, we decided to assess the psychological readiness for entrepreneurship: (1) existing entrepreneurship measurement instruments do not predict the role and psychological readiness of individuals considering an entrepreneurial career and (2) the existence of previous instruments for measuring entrepreneurial readiness on a global scale demands the development of specific tests to determine the level of psychological readiness for each individual.

As a result, this study develops instruments within the context of Indonesian small and medium-sized businesses to assess the psychological readiness for entrepreneurship. In addition to the validity and reliability of the items being debated, because they have not described the psychological side and because the evaluation of the instrument is not yet appropriate in the context of Indonesian culture, researchers need to compile and evaluate their application first through the exploratory factor analysis (EFA) process (Hoque & Awang, 2016; Hoque et al., 2018). This study will characterize the validity and reliability of the entrepreneurial psychological readiness (EPR) measuring scale items using

EFA, which can ultimately be used to measure the construct of entrepreneurial psychological readiness in the Indonesian context.

The specific objectives of this research are as follows: (1) to examine whether the psychological readiness measurement instrument is able to explain the psychological aspects of individual young entrepreneurs and (2) to determine which psychological readiness factors are capable of predicting young entrepreneurs' psychological role.

Literature review

The Characteristics of Micro, Amall, and Medium Enterprises in Indonesia

Entrepreneurship requires not only financial resources and source of authority, but also a high level of control, personal initiative, and the ability to overcome obstacles and stressful circumstances (Frese & Fay, 2001; Suárez-Álvarez & Pedrosa, 2016). Psychology contributes to numerous scientific fields, such as entrepreneurship (Østergaard et al., 2018). In psychological theory, entrepreneurship is viewed as a behaviour based on conscious individual actions (experience and expertise) and a cognitive framework (Costa et al., 2016; Østergaard et al., 2018). Social scientists determine the most crucial aspects of pursuing an entrepreneurial career (Rokhman & Ahamed, 2015). However, entrepreneurial psychologists attempt to identify personal factors, such as individual characteristics and interests. Other psychological factors, such as social support, can contribute to a person's intention to start a business (Farradinna et al., 2021).

In Indonesia, entrepreneurship education places more of an emphasis on fostering cognitive insight, managerial knowledge, business planning, marketing, finance, innovation, and creativity. In actuality, psychological aspects of entrepreneurship education are very crucial. Recently, academics have made an effort to psychologically analyse the dynamics of entrepreneurship. An important direction of entrepreneurial psychology study is thought to be capable of detecting and shaping psychological preparation for student to begin entrepreneurship in schools, as well as determining counselling and the most relevant themes, so that prospective young entrepreneurs might dare to choose a career as a business person. However, none of the several research that have been conducted have examined entrepreneurial intentions using the psychological readiness scale. Several research, however, have not studied entrepreneurial goals by evaluating the psychological readiness index.

Indonesia must be able to emphasize developing intentions and ways of innovation in integrating education, local culture, availability of capital, and individual personal character, so that becoming an entrepreneur is not merely a coincidence or a result of a lack of employment opportunities (Altinay, 2008). Not only do young Indonesians require funding support or bureaucratic mechanisms that favour entrepreneurs, but the availability of psychological resources and psychological capital is also a major concern, as they are faced with risk-taking and resiliency in the face of the challenges of running their business (Farradinna & Fikri, 2020; Olugbola, 2017).

Entrepreneurial Psychological Readiness Factor

Individual psychological readiness index measurements are used to compare the interpersonal traits of business people. This evaluation can be used to determine a person's professional readiness as well as his aptitude for assessing and spotting chances (Coduras

et al., 2016). The ability to direct and the depth of self-achievement are required, so that the creative potential and productive fields are known. The current study details the creation and approval of an instrument for assessing psychological readiness. The instrument includes a variety of parameters that are categorized based on the replies provided by the study participants.

Through observation and research of the environment, psychological readiness is described as a combination of personal traits that help individuals stand out from other business people and maximize their creative potential (Ruiz et al., 2016). Another evaluation describes psychological readiness in the index as one of the findings reached as measuring the notion of information tools (Coduras et al., 2016). Due to the dynamic character of the personality features of potential business players, developed nations have examined the psychological readiness of entrepreneurship from a young age. Therefore, to create an excellent business, it is vital to examine the facts from within the psychological traits (Semenov et al., 2018). Although this topic is sometimes overlooked, research on entrepreneurial psychological preparation is socially significant. However, to give a general overview of the psychological readiness measurement given to high school students, one opinion is that psychological readiness is defined as a different combination of psychological qualities and orientation factors (Semenov et al., 2018).

Measurement of entrepreneurial psychological readiness is defined as a set of characteristics people possess that set them apart from other entrepreneurs and enable them to monitor and analyse situational trends and therefore to channel the creativity and productivity of an entrepreneur (Coduras et al., 2016). Recently, scholars studying entrepreneurship have realized the necessity to develop a definition of entrepreneurial readiness that takes into account the psychological aspects of starting a new business in addition to capacity, knowledge, and skills (Ruiz et al., 2016). The development of the entrepreneurial mindset measurement assessment focuses more on skills assessment and comprehensive review (Purzer et al., 2016), whereas the assessment of attitudes and psychological readiness characteristics is important for assessment (Kallas, 2019; Li et al., 2016).

As a result, it is critical to develop an appropriate readiness measurement for public policy decision making. This study summarizes recent findings related to the need for measuring psychological readiness derived from currently used entrepreneurial indicators. The most important implication of a well-designed measurement of entrepreneurial psychological readiness is that it can provide early warning to policymakers, in this case the government, and provide education and capital for prospective entrepreneurs, who must be evaluated not only physically but also psychologically.

Methods

Aim and Research Questions

The importance of an information tool to measure the availability of entrepreneurs who are ready to become entrepreneurs who first show interest and are ideal as prospective entrepreneurs is our purpose in proposing this entrepreneurial psychological readiness instrument; second, to measure the readiness of the facilitated economic policies; and third, this instrument is also used to measure the readiness of social and economic progress.

Research Design

The development model for measuring entrepreneurial psychological readiness was studied in several stages. The first is a preliminary study that looked back at the need for measuring readiness from a psychological and social standpoint. The process of categorizing data based on theory and problem context will then involve reviewing the literature and developing the best model possible.

Population and Sample

This study's participants were students from cities and regencies in the Indonesian province of Riau. They are final-year students chosen, because they must make job choices after graduation. Appropriate selection of research participants is essential, this study employed a simple stratified and randomized methodology, which was determined with 5% precision using the Levy formula (2008) for each university in the Bengkalis, Dumai, and the eastern region of Pekanbaru. The research participants involved 604 students spread across the districts and cities of Riau province, Indonesia, from various study programs at several tertiary institutions. Two hundred ninety female students (48.01%) and 314 male students (51.9%) represent the three coastal and inland areas of Riau Province.

In terms of territory, respondents from Bengkalis were 32 (5.30%), 231 (38.25%) from Dumai, and 341 (56.46%) from Pekanbaru. Academic education includes 101 Madrasah Aliyah graduates (16.72%), 308 High School graduates (50.99%), and 195 Vocational High School graduates (32.28%).

Instruments

After the extensive literature review, we compiled psychological entrepreneurship readiness scales and items from the study of Coduras et al. (2016). The instrument contains 85 items to assess the level of psychological readiness for entrepreneurship. According to a five-point Likert scale, statements are rated as follows: Strongly Disagree (1), Disagree (2), Disagree or Disagree (3), Agree (4), and Strongly Agree (5). The instruments were translated from English to Indonesian by the language expert. The instruments were also adjusted to reflect Indonesian culture and the characteristics of young entrepreneurs. Furthermore, the content validity is determined by assigning experts in their fields, i.e., entrepreneurial psychologists. The expert reviewed and corrected some items to ensure the relevance of the language and the entrepreneurship psychological readiness theoretical concept.

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Data Analysis

Several analyses were carried out to confirm the psychometric properties of the measurements. An Exploratory Factor Analysis (EFA) was conducted to examine the factor structure of the Entrepreneurship Psychological Readiness (EPR) instrument. Cronbach's Alpha reliability test was then used to evaluate the instrument's reliability. Exploratory Factor Analysis (EFA) was carried out to obtain evidence about the measure's construction. EFA is a method used in multivariate statistics to run a number of hypothetical constructs (such as factors, dimensions, latent variables, synthetics, or internal attributes) to parsimoniously describe covariations. The construction of the hypothesis is concluded from the effect of manifest variables that cannot be measured directly, according to the interpretation of the results with EFA. As a result, the named factors were chosen based on the most strong resemblance of the manifest variables (Watkins, 2018).

We checked the fit of the data from the factor analysis assumptions before running the EFA analysis. The first step in this analysis is to determine the sample size. The Kaiser–Meyer–Olkin (KMO) test was performed to determine whether the sample size for the analysis was adequate (Kaiser, 1970). The predicted value is bigger than 0.07. Bartlett's Test of Sphericity was used to check whether correlations between items were large enough for EFA. To conduct an EFA, Bartlett's test of sphericity must achieve a statistical significance of less than 0.05 (Bartlett, 1954). In EFA, the following requirements must be followed in order to create a fit model: (1) there must be no cross-loading (items with high factor loading on two or more factors generated); (2) one factor must contain at least three items; and (3) the good factor loading value is more than 0.40. Items that do not fulfil the requirements are eliminated, and EFA is repeated until a fit model is identified (Matsunaga, 2010; Yu & Richardson, 2015).

Reliability test conducted to determine the consistency, stability, and dependability of the scores comprise the reliability of an instrument (McMillan, 2014). For this purpose, Cronbach's Alpha was used to examine the internal consistency of each factor extracted from the EFA. If the Alpha value is greater than 0.90, the internal consistency is excellent; if it is at least greater than 0.70, it is acceptable (Blunch, 2008).

Results

Exploratory Factor Analysis (EFA)

There were 26 items that did not comply with the requirements. Twelve of these items have factor loading values below 0.40, nine items have high cross-loading values on two factors, and five items cannot be allocated to a single factor since there are fewer than three items for each factor. In accordance with the results of the factor analysis, the fit model consists of eight factors and 59 items. The eight-factor model obtained explains 57.44% of the variance in the pattern of item relationships. The total variance is shown in Table 1.

Items from the factors are then assessed for naming by represent terms and ease of verbal communication (Kline, 2010; Yong & Pearce, 2013). The first factor is known as Personal Knowledge, the second factor as Personal Adversity, the third factor as Committed Certain Action, the fourth factor as Willingness to Learn, the fifth factor as

Table 1 Total Variance on Items with Eight-factor Model

Component	Initial eigenvalues			Extraction sums of squared loadings		Rotation sums of squared loadings	
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	18.441	31.256	31.256	18.441	31.256	31.256	6.737
2	4.171	7.070	38.326	4.171	7.070	38.326	6.473
3	3.544	6.006	44.333	3.544	6.006	44.333	4.767
4	1.971	3.341	47.673	1.971	3.341	47.673	4.673
5	1.664	2.820	50.493	1.664	2.820	50.493	3.658
6	1.577	2.672	53.166	1.577	2.672	53.166	3.281
7	1.388	2.352	55.518	1.388	2.352	55.518	2.341
8	1.135	1.924	57.442	1.135	1.924	57.442	1.959

Extraction Method: Principal Component Analysis

Personal Relationship to Others, the sixth factor as Personal Growth, the seventh factor as Passion Achieved, and the eighth factor as Related Person Support. Table 2 shows the final eight-factor model and the items factor loading.

There were 59 items loaded in the EPR instruments ranging from 0.414 to 0.831, by (1) Personal Knowledge—10 items with loading ranging from 0.467 to 0.796, (2) Personal Adversity—13 items with loading ranging from 0.414 to 0.663, (3) Committed Certain Action—8 items with loading ranging from 0.477 to 0.831, (4) Willingness to Learn—8 items with loading ranging from 0.435 to 0.716, (5) Personal Relationship to Others—8 items with loading ranging from 0.448 to 0.686, (6) Personal Growth—6 items with loading ranging from 0.494 to 0.708, (7) Passion Achieved—3 items with loading ranging from 0.692 to 0.756, and (8) Related Person Support—3 items with loading ranging from 0.578 to 0.753. This result revealed that high loading exhibits the good parsimony and inter-correlation of the instrument (Field, 2013).

Previous research indicates that the availability of resources is essential for psychological readiness (Olugbola, 2017). A psychological framework is developed for novice entrepreneurs to identify and mitigate potential psychological stress (Zakharova et al., 2018). The results of this study predict the dimensions for measuring the psychological readiness of inexperienced entrepreneurs, followed by potential managerial development. These findings support the findings of Coduras et al. (2016) and Coduras et al. (2018), which indicate that measuring entrepreneurial readiness using a rigorous scientific approach has implications for a helpful measurement instrument for predicting entrepreneurial development frameworks.

Reliability Test

The reliability of each factor of the Entrepreneurship Psychological Readiness (EPR) questionnaire was tested using an item analysis. (Blunch, 2008) defines adequate internal consistency as a range of 0.07–0.09. Except for the eighth factor, which has a lower reliability score, all factors received high scores for reliability. The total eight-factor model, on the other hand, gets a high reliability score of 0.961. The result of reliability test is shown in Table 3.

The Entrepreneurship Psychological Readiness (EPR) instrument's factors have excellent reliability scores in general, with the exception of the Related Person Support factor,

Table 2 Entrepreneurship Psychological Readiness (EPR) Instrument's Final Items and Eight-factor Structure Following the EFA procedure

	Factor							
	1	2	3	4	5	6	7	8
Factor 1: Personal Knowledge								
1. Getting the complete information before making a decision to open a business	0.467							
2. It is important for me to study the current market potential	0.623							
3. It is important for me to learn the potential of self-competence	0.667							
4. It is important for me to make a business plan	0.716							
5. It is important for me to make a survival plan so that it is properly implemented	0.791							
6. It is important for me to create a good and accurate financial plan for business continuity	0.796							
7. For me, business allocation analysis is important	0.769							
8. For me, suggestions and recommendations are essential	0.739							
9. A clear analysis of fund channels is required	0.754							
10. It's important to study the product/service innovations offered in order to make the right decisions	0.684							
Factor 2: Personal Adversity								
11. I maintain close relationships with people I care about		0.486						
12. I prefer roles and responsibilities that are obvious		0.414						
13. Stay positive even when facing challenges		0.580						
14. When an problem arises, find a resolution immediately		0.545						
15. Gather all the pertinent information, before doing any judgments		0.512						
16. I enjoy any activity I engage in		0.630						
17. Confident with my abilities		0.663						
18. Performing the obligations I've taken on		0.650						
19. Having self-control in every aspects of my life		0.642						
20. I typically bounce back from setbacks fast and effortlessly		0.581						
21. Tend to have a great aspirations in my life		0.607						
22. Taking difficult situations as challenges and opportunities in demanding my capabilities		0.662						
23. Consistent with my goals		0.644						
Factor 3: Committed Certain Action								
24. I have business creation, management, and/or management-related talents			0.477					
25. I have fundamental experience in business management			0.531					
26. I've started my own business/with other people			0.643					
27. I have taken on the role of an impromptu investor by lending money to others to launch their businesses			0.831					
28. The bureaucratic step in starting a business is my challenge as a business actor/entrepreneur			0.722					
29. I have performed as intrapreneur (business within an organization, office, or school)			0.755					

Table 2 (continued)

	Factor							
	1	2	3	4	5	6	7	8
30. I perform as an investor who disburses funds to others without taking part in its management			0.811					
31. Improve management abilities to simplify my business's path			0.591					
Factor 4: Willingness to Learn								
32. In terms of finances, I rely on my skills				0.435				
33. Become an entrepreneur/business actor as a career				0.654				
34. I am confident in my abilities as an business actor and entrepreneur				0.669				
35. The business idea that I develop comes from my own knowledge and capacity				0.699				
36. Activities and business ideas come from observing the environment around me				0.716				
37. The business activity that I want to develop is the result of observing market needs				0.647				
38. Based on market observations, I predict products/services that can be improved by innovation				0.650				
39. I intend to start a business initiative				0.573				
Factor 5: Personal Relationship to Others								
40. Opportunity to influence others					0.686			
41. Be able to take actions that significantly affect other persons					0.599			
42. I stay in close contact with those I actually value					0.536			
43. I take on a leadership role so that others can accomplish their goals					0.559			
44. I am aware of other people's expectations of me					0.584			
45. I seize the opportunity to influence how communities make decisions					0.511			
46. I took the opportunity to be part of the team					0.448			
47. I'm sure that many people currently value me					0.520			
Factor 6: Personal Growth								
48. I appreciate having close, amicable, and cooperative relationships with people						0.555		
49. I have the opportunity to develop myself						0.586		
50. Enjoy the chance to assign more difficult and demanding duties and goals						0.552		
51. Enjoy the freedom and opportunity to talk and socialize with others						0.708		
52. Have goals and novelties that are sustainable, highly motivated, and challenging						0.657		
53. Opportunity to create something new						0.494		
Factor 7: Passion Achieved								
54. I decide to act in this way because I want to							0.756	
55. I am happy with the choice I made and how things have turned out thus far							0.796	
56. I have realized myself regarding the current situation							0.692	
Factor 8: Related Person Support								
57. In my close family there are entrepreneurs								0.709
58. Some of my close friends/colleagues are entrepreneurs								0.753
59. I admire a well-known businessman								0.578

Table 3 Cronbach's Alpha for Each Factors of the Entrepreneurship Psychological Readiness (EPR) Instrument

	Cronbach's Alpha	Cronbach's Alpha based on standardized items	Number of items
Personal Knowledge	0.928	0.928	10
Personal Adversity	0.908	0.908	13
Committed Certain Action	0.886	0.887	8
Willingness to Learn	0.899	0.899	8
Personal Relationship to Others	0.899	0.899	8
Personal Growth	0.815	0.817	6
Passion Achieved	0.815	0.817	3
Related Person Support	0.623	0.627	3

which has a relatively low reliability score. Nevertheless, because the instrument has not been evaluated for utilization with other subjects, the items in this factor must be included in the overall instrument.

Discussion

Data were acquired from 604 participants (290 females and 314 males) for the study. The collected data were evaluated using Exploratory Factor Analysis (EFA). Based on the EFA findings, 26 items were excluded from the instrument, because the factor loading was less than the predefined value, overlapped, or lacked the number to create a single factor. The final result is a 59-item instrument comprised of 8 factors.

According to the items in the factor, the first factor is called Personal Knowledge (PK), and it has 10 items. The second factor is called Personal Adversity (PA), and it has 13 items. The third factor is called Committed Certain Action (CCA), and it has 8 items. The fourth factor is called Willingness to Learn (WL), and it has 8 items. The fifth factor, Personal Relationship to Others (PRO), consists of 8 items that can be measured. The sixth factor is called Personal Growth (PG), and it has 6 items, the seventh factor is called Passion Achieved (PAch), and it has 3 items, the eighth factor is called Related Person Support (RPS), and it has 3 items.

The psychological readiness of entrepreneurship has been carried out by developing 8 characteristic factors. These eight factors reflect the psychological state of both prospective entrepreneurs and individuals who are running a business. All of these component factors describe the psychological readiness of individuals in the following: the readiness of individual knowledge related to the business and products developed; mental readiness to face obstacles; commitment to running a business; self-readiness to continue learning; individual readiness to develop relationships with others; interest in growing and developing; developing self-potential; taking advantage of available resources. The overall variance explained is 57.44%, with the first factor contributing the most (31.25%). Other contribution rates are as follows: 7.07%, 6.06%, 3.34%, 2.82%, 2.67%, 2.35%, and 1.92%. Overall Entrepreneurship Psychological Readiness (EPR) instrument reliability is 0.96, indicating that the measurement is reliable.

The EPR instrument, based on the results of the EFA in this study, can be used to determine individual readiness in entrepreneurship by measuring knowledge, personal abilities, actions, willingness to learn, relationships with others, self-development,

enthusiasm, and support from others. According to studies, the psychological readiness for entrepreneurship is significantly influenced by socio-economic factors such as the state of the labor market and policymaker support (Romanova, 2018). Psychological roles can represent the suitability of an individual's personality and goals in determining a career as an entrepreneur (Zhao & Seibert, 2006), not only in the field of developing entrepreneurial theory, but also when selecting an entrepreneurial career.

Individual readiness in entrepreneurship information can be utilized to improve individual capability before engaging in entrepreneurial activities. Individuals who run a business are constantly confronted with pain and happiness, love and regret, challenges and obstacles. The effectuation theory, according to Matalamäki (2017) explains that entrepreneurs confront every possibility, uncertainty, and flexibility and conduct numerous experiments. Consequently, the contribution of this study is to demonstrate how to determine an individual's readiness to face a variety of challenges while innovating and developing products. However, further research with Confirmatory Factor Analysis (CFA) is required to evaluate the factorial validity of the model obtained from the EFA results.

For the government to make an informed decision on whether to provide capital assistance, it must consider the psychological readiness of each individual (Kallas, 2019). The EPR model identifies the psychological readiness of entrepreneurship as a set of preconditions for government decision-making at the outset.

Conclusion

The Entrepreneurship Psychological Readiness (EPR) instrument measures individual expertise, attributes, deeds, passion for improving, connections, self-development, excitement, and encouragement from others. Information gathered from the EPR instrument can be used to enhance an individual's psychological readiness before engaging in entrepreneurial activities. The results of EFA state that the psychological role determines the individual's intensity in deciding on a career as an entrepreneur from the point of psychological readiness. In addition, based on the distribution of data from regional topography shows that suburban areas dominate the distribution of participant characteristics. Based on the analysis, Passion Achieved is the factor that most predict psychological entrepreneurship readiness. The factor shows that individuals have the courage, awareness, and ability as entrepreneurs.

Apart from explaining from an individual's point of view, policymakers such as local governments and investors can predict individuals' psychological readiness in considering providing entrepreneurship training or business capital loans. Policymakers can consider this EPR instrument to assess the feasibility of local young entrepreneurs, such as being given entrepreneurial training, capital loans, facilitating businesses, and providing annual awards. The EPR instrument contributes to the evaluation of a person's psychological readiness to confront various challenges, whether innovating, launching, or engaging in many forms of entrepreneurship. This instrument can also be used to predict individual psychological characteristics that dominate the readiness of entrepreneurship.

Limitations and Recommendations

This research is willing to accept new sources to be investigated in the future on topics that align with entrepreneurship's psychological readiness in the context of measurement. There is a need to consider examining causality relationships more explicitly and conducting cross-country comparisons that can be utilized to validate existing findings. Policymakers may need help understanding the interpretation of the indicators described in predicting psychological readiness. Based on these limitations, further research can be considered involving other factors beyond the role of psychology.

Abbreviations

EFA	Exploratory Factor Analysis
CFA	Confirmatory Factor Analysis
EPR	Entrepreneurship Psychological Readiness
PK	Personal Knowledge
PA	Personal Adversity
CCA	Committed Certain Action
WL	Willingness to Learn
PRO	Personal Relationship to Others
PG	Personal Growth
PA	Passion Achieved
RPS	Related Person Support

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Author Contributions

The first author has been instrumental in the tool's conceptualization, design, development, and analysis of the research results. The second and third authors have contributed to the collected research data. The fourth author has contributed to the data analysis. All authors read and approved the final manuscript.

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Availability of Data and Materials

The datasets analyzed during the current study are not publicly available due they are part of an ongoing research project but are available from the corresponding author on reasonable request.

Declarations

Competing interests

To the best of our knowledge, no competing financial and non-financial interests are present concerning the manuscript.

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References

Altinay, L. (2008). The relationship between an entrepreneur's culture and the entrepreneurial behavior of the firm. *Journal of Small Business and Enterprise Development, 15*, 111–129. https://doi.org/10.1108/14626000810850874

Amofah, K., Saldrigues, R., & Akwaa-Sekyi, E. K. (2020). Entrepreneurial intention among MBA students. *Cogent Business & Management, 7*(1), 1832401.

Bartlett, M. S. (1954). A further note on the multiplying factors for various chi-square approximations in factor analysis. *Journal of the Royal Statistical Society: Series B (methodological), 16*(2), 296–298. https://doi.org/10.1111/j.2517-6161.1954.tb00174.x

Blunch, N. J. (2008). *Introduction to structural equation modeling using SPSS and AMOS*. SAGE Publication Ltd.

Coduras, A., Saiz-Alvarez, J. M., & Ruiz, J. (2016). Measuring readiness for entrepreneurship: An information tool proposal. *Journal of Innovation and Knowledge, 1*(2), 99–108. https://doi.org/10.1016/j.jik.2016.02.003

Coduras, A., Velilla, J., & Ortega, R. (2018). Age of the entrepreneurial decision: Differences among developed, developing, and non-developed countries. *Economics and Business Letters, 7*, 36. https://doi.org/10.17811/ebl.7.1.2018.36-46.

Costa, S. F., Ehrenhard, M. L., Caetano, A., & Santos, S. C. (2016). The role of different opportunities in the activation and use of the business opportunity prototype. *Creativity and Innovation Management, 25*(1), 58–72. https://doi.org/10.1111/caim.12160
Douglas, H. E. (2009). *Science, policy, and the value-free ideal*. University of Pittsburgh Press. https://doi.org/10.2307/j.ctt6wrc78
Farradinna, S., & Fikri, F. (2020). Intensi kewirausahaan di kalangan mahasiswa ditinjau dari motivasi berprestasi dan ketakutan pada kegagalan. *Jurnal Ekonomi Bisnis dan Kewirausahaan, 9*(3), 177. https://doi.org/10.26418/jebik.v9i3.39523
Farradinna, S., Herawati, I., & Mulyani, A. H. (2021). Psychological characteristics of entrepreneurship potentials among vocational high school students. *Jurnal Pendidikan Teknologi dan Kejuruan, 27*(1), 66–73. https://doi.org/10.21831/jptk.v27i1.32859
Field, A. (2013). *Discovering statistics using IBM SPSS statistics* (4th ed.). SAGE Publication Ltd.
Frese, M., & Fay, D. (2001). Personal Initiative (PI): An active performance concept for work in the 21st century. *Research in Organizational Behavior, 23*, 133–187.
Hoque, A. S. M. M.; & Awang, Z. (2016b). Exploratory Factor Analysis of entrepreneurial marketing: Scale development and validation in the SME context of Bangladesh. International Social Sciences and Tourism Research Conference, Terengganu, UniSZA, pp. 20–22.
Hoque, S., & Awang, B. (2018). Exploratory factor analysis of entrepreneurial orientation in the context of Bangladeshi small and medium entreprises (SMES). *European Journal of Management and Marketing Studies, 3*(2), 81–94. https://doi.org/10.5281/zendo.1292331
Kaiser, H. F. (1970). A second generation little jiffy. *Psychometrika, 35*(4), 401–415. https://doi.org/10.1007/BF02291817
Kallas, E. (2019). Environment-readiness entrepreneurship intention model: The case of Estonians and the Russian-Speaking Minority in Estonia. *SAGE Open*. https://doi.org/10.1177/2158244018821759
Kline, R. (2010). Principles and practice of Structural Equation Modeling. In *Guilford Press*.
Kukoc, K., & Regan, D. (2008). *Measuring entrepreneurship*. Springer. https://doi.org/10.1007/978-0-387-72288-7.
Levy, P. S., & Lemeshow, S. (2008). *Sampling of populations: Methods and applications* (4th ed.). Wiley.
Li, C. Q., Harichandran, R. S., Carnasciali, M. I., Erdil, N. O., & Nocito-Gobel, J. (2016). Development of an instrument to measure the entrepreneurial mindset of engineering students. *ASEE Annual Conference and Exposition, Conference Proceedings*, *2016-June*. https://doi.org/10.18260/p.26819
Matalamäki, M. (2017). Effectuation, an emerging theory of entrepreneurship—towards a mature stage of the development. *Journal of Small Business and Enterprise Development*. https://doi.org/10.1108/JSBED-02-2017-0030
Matsunaga, M. (2010). How to factor-analyze your data right. *International Journal of Psychological Research, 3*(1), 97–110.
McMillan, J. H. (2014). *Classroom assessment: principles and practice for effective standards-based instruction*. Pearson.
Olugbola, S. (2017). Exploring entrepreneurial readiness of youth and start-up success components: Entrepreneurship training as a moderator. *Journal of Innovation & Knowledge, 2*, 1–17. https://doi.org/10.1016/j.jik.2016.12.004
Østergaard, A., Santos, S. C., & Costa, S. F. (2018). Psychological Perspective on Entrepreneurship BT. In R. V. Turcan & N. M. Fraser (Eds.), *The Palgrave handbook of multidisciplinary perspectives on entrepreneurship* (pp. 17–41). Springer International Publishing. https://doi.org/10.1007/978-3-319-91611-8_2
Purzer, S., Nicholas, F., & Natarja, L. (2016). Evaluation of current assessment methods in engineering entrepreneurship education. *Advances in Engineering Education, 6*(1), 1–27.
Rokhman, W., & Ahamed, F. (2015). The role of social and psychological factors on entrepreneurial intention among islamic college students in Indonesia. *Entrepreneurial Business and Economics Review, 3*(1), 29–42. https://doi.org/10.15678/EBER.2015.030103
Romanova, E. V. (2018). Psychological readiness for an entrepreneurship at the students planning to open their business in the construction branch. *Materials Science Forum, 931*, 1154–1159.
Ruiz, J., Soriano, D. R., & Coduras, A. (2016). Challenges in measuring readiness for entrepreneurship. *Management Decision, 54*(5), 1022–1046. https://doi.org/10.1108/MD-07-2014-0493
Salazar-Xirinachs, J. M. (2012). What does the world of work for 1.2 billion youth look like? A vision for the future grounded in today 's realities and research. *ILO Global Youth Economic Opportunities Conference*, 1–11.
Semenov, V. L., Zakharova, A. N., Patianova, A. O., Kadyshev, E. N., Dulina, G. S., & Talanova, T. (2018). *Improving competitiveness of tourist and recreational complex of region through mechanism of business activation*. *61*(Icemw), 277–282. https://doi.org/10.2991/icemw-18.2018.50
Suárez-Álvarez, J., & Pedrosa, I. (2016). The assessment of entrepreneurial personality: the current situation and future directions. *Papeles del Psicologo, 37*(1), 62–68.
Uhryn, O. (2020). Psychological readiness of students to work in a professional field. *Journal of Education Culture and Society, 4*, 97–107. https://doi.org/10.15503/jecs20132.97.107.
Watkins, M. W. (2018). Exploratory factor analysis: A guide to best practice. *Journal of Black Psychology, 44*(3), 219–246. https://doi.org/10.1177/0095798418771807
Yong, A. G., & Pearce, S. (2013). A beginner's guide to factor analysis: Focusing on exploratory factor analysis. *Tutorials in Quantitative Methods for Psychology, 9*(2), 79–94. https://doi.org/10.1057/fsm.2014.17
Yu, T., & Richardson, J. C. (2015). An exploratory factor analysis and reliability analysis of the student online learning readiness (SOLR) instrument. *Online Learning Journal, 19*(5), 120–141. https://doi.org/10.24059/olj.v19i5.593
Zakharova, A.N., Dulina, G.S., Talanova, T., Semenov, V.L., Gubanova, N., & Getskina, I.B. (2018). Psychological readiness of high school students for entrepreneurial activities and financial literacy. In *Proceedings of theInternational conference "Economy in the modern world" (ICEMW 2018)*. https://doi.org/10.2991/icemw-18.2018.44.
Zhao, H., & Seibert, S. E. (2006). The Big Five personality dimensions and entrepreneurial status: A meta-analytical review. *Journal of Applied Psychology, 91*(2), 259–271. https://doi.org/10.1037/0021-9010.91.2.259

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