A Measurement for the Construct of Entrepreneurial Education

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Abstract: The intellectual puzzle exists to uncover whether the term entrepreneurial education has been defined in the existing literature more appropriately in today's business context. Moreover, a well-accepted definition and measurement for measuring entrepreneurial education must be needed. This paper attempts to develop a comprehensive definition of entrepreneurial education and a measurement of the construct. To do so, a desk research strategy is used. Initially, the study identified nine common characteristics through the content analysis of the explanations given by various scholars. Next, 29 items under three elements were developed using inductive and deductive approaches. Next, an online questionnaire was distributed among 163 randomly selected management university students. Finally, Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) are performed. 22 items out of 29 loaded significantly on three factors. Finally, no validity concerns emerged, and all things were interpreted consistently across different situations according to the reliability results. As there is an absence of a comprehensive, timely definition and a measurement for the entrepreneurial education construct, this study bridges the knowledge gap in the entrepreneurial literature by providing a comprehensive definition and a measurement with 22 items.

Keywords: Entrepreneurial education, General knowledge entrepreneurial education, Motivational entrepreneurial education, self-efficacy-focused entrepreneurial education.

I. Introduction

Individuals worldwide find entrepreneurship as an avenue to create wealth, stimulate economies, and fulfill self-employment dreams (Bauman & Lucy, 2019). After understanding the importance of an entrepreneurial mindset among students who can be an entrepreneur in the future, Entrepreneurship Studies is a newly introduced course in school and the university curriculum of the Sri Lankan education system (Karunarathne et al., 2018) as an opening step to promote the entrepreneurial mindset among Sri Lankan students, 'entrepreneurship' was initially introduced as a lesson for commerce subject into the grade 10 and 11 curricula in 2007. Universities worldwide identify the importance of entrepreneurial education as renowned by the increased entrepreneurship majors (Cho & Lee, 2018). The Ministry of Higher Education in Sri Lanka has realized that there is a significant effect on attitude changes of university students through introducing Entrepreneurial Education (EE) as a part of the tertiary education curriculum. However, the outcome of this new initiative is still invisible due to the limitations of the country's old-style educational system. Moreover, it requires studying the entrepreneurial education process and context to make learning and teaching more effective in this practical subject, leading to developing capable thinkers and doers in an entrepreneurial way.

When referring to the different explanations given by various scholars, entrepreneurial education comprises other components. Some descriptions are narrow, and some are wide. Further, those definitions are context-based, multi-dimensional, and vary from country to country. However, an intellectual difficulty arises in determining whether entrepreneurial education has been defined more appropriately in today's corporate context in the existing literature. Therefore, a comprehensive definition of entrepreneurial education, widely agreed criteria, and a measurement for assessing EE are needed for the entrepreneurial literature. Thus, the knowledge gap identified in this study is the absence of a comprehensive definition for EE and a measurement. Therefore, this study attempts to bridge this knowledge gap by developing a broad definition for EE, considering past literature, and creating a measure of this concept.

II. Methods of the study

This is a conceptual study that makes some theoretical contributions to entrepreneurial education. A comprehensive, focused literature survey was done using a desk research strategy. The literature survey was based on the research articles in the central databases such as Sage, Taylor, and Francis Online, SpringerLink, ScienceDirect, Emerald, JSTOR, Scopus, and Research Gate EBSCO Host, and Wiley Online Library published from 1991 to 2021. A systematic examination was conducted to find the definitions of entrepreneurial education, and all of them were analyzed to reveal specific findings regarding the content analysis results.

Next, different steps have been used to construct a scale to measure entrepreneurial education. Initially, to develop items for EE, both deductive and inductive approaches for item generation. Using the deductive method, with the aid of past literature, common characteristics and the dimensions highlighted by a different scholar have been used to create items of EE. In contrast, an inductive approach is also used for item generation by discussing the content of the construct with focused group experts in the entrepreneurial education domain. Next, an online questionnaire was developed with 29 items; the potential study respondents were management university students in their third and final year. They are selected based on a stratified random sampling technique.

Later, its validity and reliability were assessed for scale construction for EE, with minor measurement errors. Thus, an online questionnaire is developed with 29 items; potential respondents are management university students in their third and final years and are selected based on a stratified random sampling technique.

Then, Exploratory Factor Analysis (EFA) is performed for scale development. Before running the EFA, the data appropriate for factor analysis is checked based on three factors: sample size, correlation matrix factorability, and Kaiser-Meyer- Olkin (KMO) Sampling Adequacy Check, or Bartlett's Sphericity Test as suggested by Iskamto et al. (2020). Finally, Confirmatory Factor Analysis (CFA) is performed to ensure the instrument's validity with Amos, a powerful Structural Equation Modelling (SEM) software.

III. Review of the past studies of entrepreneurial education

EE is subjective, as its definition varies from one context to another. Therefore, it is possible to observe that different authors describe it differently. The authors' descriptions of the term' EE' are shown below based on the past literature.

Meyer and Allen (1991) define EE using lectures, curriculum, and programs. These events provide students with the knowledge and skills necessary for students passionate about pursuing entrepreneurship. In addition, Bechard and Toulouse (1998) stated that EE is a program or a course that targets to provide business knowledge to create new businesses through training people. Davidsson (2004) claimed that EE is a process content or curriculum that teaches students to identify, assess, and pursue recognized new business opportunities. Jones and English (2004) stated that EE is developing the skills, knowledge, and self-esteem to recognize opportunities and potential cash recognition for initiating a business venture in risk and uncertain situations. Further, Linan (2004) defined entrepreneurial education as 'the whole set of education and training activities -within the educational system to develop in the participants the intention to perform entrepreneurial behavior, or some of the elements that affect that intention, such as entrepreneurial knowledge, the desirability of the entrepreneurial activity, or its feasibility' (p. 163).

In 2005, Van Gelderen et al. acknowledged that EE is the structured formal conveyance of entrepreneurial competencies, the concepts, skills, and mental awareness individuals use when starting or developing their business ventures. In addition, Kuratko (2005) confirmed that EE is the process of enhancing skills and concepts, recognizing opportunities that others overlooked, and having the confidence and conception to act where others hesitated. Moreover, Fayolle et al. (2006) explain that EE is any pedagogical program or process of education to teach entrepreneurial attitudes and skills to develop certain personal qualities and is not exclusively focused on the immediate creation of new businesses.

Wilson et al. (2007) confirmed that EE is a platform through which individuals are exposed to practical business knowledge, build self-confidence, and develop skills to succeed in a business venture. Bluedorn and Martin (2008) asserted that it combines communication, skills, and competencies in entrepreneurship. Further, Van Gelderen et al. (2008) indicated that EE reflects a person's stimulation and capacity to distinguish between opportunity and seeking self-esteem. Moreover, Fayolle and Gailly (2009) claimed that EE is all activities that foster entrepreneurial mindsets, attitudes, and skills in various areas for idea generation, startup, growth, and innovation. In 2010, Izedonmi stated that EE communicates and teaches competencies, skills, and values needed to recognize business opportunities organize, and start new business ventures.

In addition, Mwasalwiba (2010) explained that EE is associated with opportunity recognition, venture creation, and growth. Entrepreneurship education helps in imparting entrepreneurial skills among individuals. Lorz et al. (2011) stated that EE is an effort to create entrepreneurial awareness. Moreover, Ekpoh and Edet (2011) declared that EE is the sum of training and motivating activities in an educational system that offers entrepreneurial skills, inspiration, and knowledge to pursue entrepreneurial business. In addition, Do Paco et al. (2011) claimed that EE is a process of developing the ability to think innovatively and creatively and acquire the skills and knowledge they need to cultivate business concepts and take them to market. Arasti et al. (2012) explained EE EE creates entrepreneurial awareness and equips the students with the required entrepreneurial skills, knowledge, cognition, and entrepreneurial spirit, and Fatoki (2014) said EE seeks to provide students with knowledge, skills, and motivation to encourage entrepreneurial studies in a variety of settings. Moreover, Patricia and Silangen (2016) claimed that EE is any pedagogical (educational) education p r ocess of entrepreneurial attitudes and skills.

Next, Grichnik et al. (2014) explained that EE enhances the human capital skills of students, encouraging them to discover, create, and exploit opportunities. In addition, Do Paco et al. (2015) stated that EE is a psychological factor whose expected result is to alter positive elements of psychological traits' features by predicting their intention to act in a specified behavior. Patricia and Silangen (2016) explained that EE is any pedagogical (educational) education p r ocess of entrepreneurial attitudes and skills. Further, Hsiung (2018) stated that EE nurtures students with entrepreneurial skills to develop creative ability, the spirit of entrepreneurship, and practical knowledge and competence. Next, Saptono et al. (2020) explained that EE is a pedagogical program or process of education for entrepreneurial attitudes and skills. In addition, Handayati et al. (2020) explain that EE helps individuals acquire resources through learning and information transfer. Finally, Mahlaole and Malebana (2021) acknowledged that employment versus entrepreneurship or still need to experience beginning their businesses before enrolling in the entrepreneurship course.

When considering the above descriptions on EE, this concept is multi-dimensional. Considering all the descriptions provided by the above scholars, the nine prominent characteristics /common elements were identified in the study.

IV. Conceptualization of entrepreneurial education

Derived characteristics

1. An educational program or an educational process

2. Developing entrepreneurial knowledge and skills

3. Shape entrepreneurial attitudes and entrepreneurial self-efficacy

4. Create awareness of new business idea generation and new opportunity recognition

5. Create entrepreneurial awareness on venture creation

6. Business growth and innovation

7. motivate students to be passionate about pursuing entrepreneurship

8. To face risk and uncertainty in a variety of business settings

9. It is a psychological factor

Thus, nine characteristics were identified as common characteristics, and they were considered for subsequent analysis. Table 1 shows the number of counts in each definition as follows.

Table 1: Characteristics in the Definitions

No	Author/s	Year	Characteristics								
			1	2	3	4	5	6	7	8	9
1	Meyer, J.P., and Allen, N.J.,	1991	×	×					×		
2	Bechard, J.-P., and Toulouse, J.M.	1998	×	×			×				
3	Davidsson, P.	2004	×			×					
4	Jones, C. and English, J.	2004	×	×		×				×	
5	Van Gelderen et al.	2004	×	×		×	×				
6	Kuratko, D.F.	2005	×	×		×					
7	Fayolle et al.	2006	×	×	×		×				
8	Wilson et al.	2007		×	×			×			
9	Bluedorn, A.C. and Martin, G.	2008		×							
10	Van Gelderen et al.	2008				×					

#	Author	Year									
11	Fayolle, A. and Gailly, B.	2009		×	×	×	×	×			
12	Izedonmi, P.F.	2010		×	×	×	×				
13	Mwasalwiba, E.S.	2010		×		×	×	×			
14	Lorz, M. and Volery, T.	2011				×	×				
15	Ekpoh, U.I. and Edet, A.O.	2011	×	×	×						
16	do Paço et al.	2011		×		×					
17	Arasti et al.	2012		×	×	×	×				
18	Ediabonya, K.	2013	×					×			
19	Fatoki, O.	2014	×	×	×					×	
20	Grichnik et al.	2014		×	×	×					
21	Do Paço et al.	2015									×
22	Patricia, P. and Silangen, C.	2016	×	×	×						
23	Hsiung, T.	2018		×	×			×			
24	Cho, Y.H. and Lee, J.H.	2018		×	×						
25	Saptono et al.	2020	×	×	×						
26	Saraih et al.	2019	×	×							
27	Handayati et al.	2020		×							
28	Mahlaole, S.T. and Malebana, M.J.	2021				×	×				
	Total		13	22	12	13	09	05	01	02	01

The content analysis revealed that in the definitions numbering 28 out of 09, the item with the highest intensity of consideration (Number of counts in the reports) is item number 2. i.e., Developing entrepreneurial knowledge and skills. The next highest item is numbered one and 4,i.e., an educational program or an educational process and creating awareness of new business idea generation and new opportunity recognition. The third and fourth ones regarding the intensity of consideration are items numbered 3, i.e., Shaping entrepreneurial attitudes and self-efficacy and creating entrepreneurial awareness on venture creation.

Therefore, referring to the content analysis of the common characteristics, the working definition of this study has been developed as follows.

'Entrepreneurial education is an education process for developing entrepreneurial knowledge, skills, and attitudes to build students' self-efficacy to identify new business opportunities, venture creation, growth, and innovation.'

According to the above, the three dimensions identified in the content of the definition are as follows.

1. **General Knowledge entrepreneurial education** - General entrepreneurial education provides basic knowledge about entrepreneurship. It builds the capability to be an entrepreneur to discover the students' latent talents and develop new ones.

2. **Motivational entrepreneurial education** – It influences one's aspiration to be an entrepreneur. General education about entrepreneurship becomes ineffective if students are not motivated to become entrepreneurs.

3. **Self-efficacy-focused entrepreneurial education** After motivational entrepreneurial education, this type of education provides opportunities to develop self-efficacy among students, which is another essential requirement for entrepreneurship.

Scale development for entrepreneurial education

Item Generation

The first step is generating items in the survey. Item generation is a creative task that requires research to understand the meaning of entrepreneurial education under study. This study has used both deductive and inductive approaches for item generation. Using the deductive method, with the aid of past literature, the researcher carefully defined the construct and identified common characteristics and the dimensions highlighted by a different scholar. Next, based on the dimensions and the common elements, the researcher has created items that measure three other aspects of the construct.

In contrast, this study has used an inductive approach for item generation by discussing the construct with focus group experts in the entrepreneurial education domain. However, talking to the experts in entrepreneurial education in a focus group setting provided additional insights. It suggested other items for inclusion, Such as a focus group transcript as a base document for item generation. The selected scale for all things was a five-point Likert scale based on previous research using the same construct.

Finally, this study has identified three aspects of entrepreneurial education using indicative and deductive approaches. They are,

I. General knowledge of entrepreneurial education

II. Motivational entrepreneurial education

III. Self-efficacy-focused entrepreneurial education

The ten items for each aspect were constructed using inductive and deductive approaches. All thirty items are Likert items anchored in a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree).

Scale Construction

Scale construction is assessing the properties of the constructed scale using data collected from a representative sample. A scale is helpful if it measures the underlying entrepreneurial education that the researcher intends the scale to measure. A scale is reliable if the measurement error of the scale is small. It can be concluded that high reliability is necessary for high validity. This study generated 30 items under three different aspects of entrepreneurial education and constructed an online questionnaire based on those items. Next, it is directed to male management university students in their third and final year. A stratified random sampling technique was used to select respondents. A total of 164 participants filled out the questionnaire. The reason for choosing them as the potential respondents is that they have already decided whether they work under someone else or are an entrepreneur for their venture. Pilot test results have shown that females are less likely to start their experience than male management university students. Therefore, the questionnaire with 30 items was directed to female management university students in their third year and final years.

Once the survey was administered, the researcher did a series of technical checks to weed out unacceptable items and ensure that the scale represented a one-dimensional construct.

Scale Evaluation

This study examined the estimated correlation matrix for all items using the survey responses and then analyzed the correlation matrix using *exploratory factor analysis (EFA).* Factor analysis is a way of exploring the structure of a correlation matrix (Russell, 2010). This approach accepts that the estimated correlation arises from two reasons: the underlying perception of entrepreneurial education that the students use to answer the scale items on the questionnaire and random error because of the measurement process.

In this study, the factor analysis model first adjusted the correlations for the reliability of individual scale items and then developed a decomposition of the modified correlation matrix. To generate a large set of items for consideration in scale construction, the researcher has deleted unacceptable scale items until a one-factor solution emerges.

Exploratory Factor Analysis (EFA)

This study has ensured the accuracy of data entry, missing values, normality, and outliers. Coefficients of skewness and kurtosis have also been studied. In this research, all items were normally distributed, where skewness and kurtosis statistics were examined, indicating that all values were within the range ±2 (Afthanorhan, 2013; Byrne, 2010). While the standard scores z were within the scope of ±4 (Iskamto et al., 2020) for each object, it revealed no extreme cases and suggested no outliers in the results. Therefore, the data were appropriate for further calculations since no major violation was noticed.

Before running the EFA, this study should ensure that the data is appropriate for factor analysis based on three factors, namely sample size, correlation matrix factorability, and Kaiser-Meyer- Olkin (KMO) Sampling Adequacy Check, or Bartlett's Sphericity Test (Iskamto et al., 2020). Hair, Black, Babin, and Anderson (2014) suggested that sample sizes should be just 100 or more significant for the sample size to be sufficient to run EFA. Since the sample size of this study is 163, the first requirement for EFA was satisfied.

Hair et al. (2014) and Mondiana et al. (2018) specified that if the Kaiser-Meyer-Olkin (KMO) reaches 0.6 and Bartlett's Sphericity Test (BTS) must be relevant at α<0.05, the correlation matrix factorability is supposed. This study has satisfied the minimum threshold values of the Kaiser-Meyer-Olkin (KMO) sampling adequacy check or Bartlett's sphericity test. Then, the researchers decided that the sample was sufficient to perform factor analysis (Ghazali et al., 2019).

Findings and Results of EFA

Table 2: KMO and Bartlett's Test

Kaiser-Meyer-Olkin measure of Sampling Adequacy.		.958
Bartlett's Test of Sphericity	Approx. Chi-Square	4359.482
	df	406
	Sig.	.000

Table 2 above shows that Bartlett's Sphericity Test is significant (chi-square with the degree of freedom (df) 406= 4359.482 with a significance value = 0.000). The measurement of adequate KMO sampling is 0.958, higher than Kaiser and Rice's (1974) proposed minimal accepted value of 0.5. Therefore, these findings have a reasonable basis for progressing to the next stage of the process. Thus, the results specify that the data is sufficient for the reduction process.

Table 3: Total variance explained.

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	16.898	58.270	58.270	16.898	58.270	58.270
2	1.986	6.847	65.117	1.986	6.847	65.117
3	1.137	3.920	69.037	**1.137**	3.920	**69.037**
4	.799	2.756	71.792			
5	.730	2.516	74.308			
6	.682	2.350	76.659			
7	.601	2.071	78.730			
8	.547	1.887	80.617			
9	.543	1.872	82.490			
10	.532	1.834	84.323			
11	.459	1.584	85.908			
12	.435	1.499	87.406			
13	.402	1.385	88.791			
14	.331	1.141	89.932			
15	.310	1.070	91.002			

16	.308	1.061	92.063			
17	.270	.933	92.995			
18	.267	.920	93.915			
19	.228	.788	94.703			
20	.216	.745	95.449			
21	.201	.694	96.142			
22	.192	.662	96.804			
23	.177	.610	97.414			
24	.148	.511	97.925			
25	.141	.485	98.409			
26	.132	.454	98.864			
27	.124	.426	99.290			
28	.106	.365	99.655			
29	.100	.345	100.000			

Extraction Method: Principal Component Analysis.

The decision for the variety of factors to result is based on the size of the eigenvalues and the percentage of the stated variance (Iskamto et al., 2020). This research considers only factors equivalent to or higher than one to be significant and finds that 60% of the total variance is satisfactory (Hair et al., 2014). In the above Table 3 outcome, all three variables reflect 69.037 percent of the total data variance. The factor clarified 69.037 percent of the conflict, with about 1.137 of its eigenvalues.

Table 4: Rotated Component Matrix

	Component		
	1	2	3
General Knowledge EE 01	.751	.221	.335
General Knowledge EE 02	.804	.212	.172
General Knowledge EE 03	.716	.387	.177
General Knowledge EE 04	.647	.368	.155
General Knowledge EE 05	.713	.316	.282
General Knowledge EE 06	.521	.176	.306
General Knowledge EE 07	.721	.361	.278
General Knowledge EE 08	.780	.325	.237
General Knowledge EE 09	.558	.464	.417
Motivational EE 01	.493	.235	.550
Motivational EE 02	.602	.285	.532
Motivational EE 03	.533	.284	.614
Motivational EE 04	.584	.312	.517

Motivational EE 05	.598	.253	.566
Motivational EE 06	.499	.233	.696
Motivational EE 07	.523	.389	.564
Motivational EE 08	.517	.382	.600
Motivational EE 09	.171	.340	.763
Motivational EE 10	.105	.370	.523
Self-Efficacy EE 01	.133	.648	.271
Self Efficacy EE 02	.488	.692	.167
Self Efficacy EE 03	.398	.625	.227
Self Efficacy EE 04	.186	.814	.228
Self Efficacy EE 05	.240	.740	.379
Self Efficacy EE 06	.289	.722	.286
Self Efficacy EE 07	.320	.720	.407
Self Efficacy EE 08	.449	.693	.152
Self Efficacy EE 09	.317	.781	.185
Self-Efficacy EE 10	.334	.775	.248

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

To ensure better indicator reliability, the factor loadings of each item should be greater than 0.7, which is an ideal threshold value, but above 0.6 is also acceptable (Hair et al., 2014). At the initial stage before rotation, all items were loaded to the first factor and did not get any variable for the other two elements. Therefore, factor rotation has been done using the varimax method as the researcher needs an idea about the relationship between factors. From table 3 above, the factor loading presented a clean and interpretable solution: the

Twenty-nine items have loaded significantly on three factors as the study conceptual entrepreneurial education. According to the rotated component matrix in Table 4, 22 out of 29 articles have factor loads above the 0.6 lower bound (Awang, 2012). However, objects with lower loads below 0.60 should be removed from further review (Awang, 2015). Therefore, the item: General Knowledge EE 06, General Knowledge EE 09, Motivational EE 01, Motivational EE 04, Motivational EE 05, Motivational EE 07, and Motivational EE 10 have a loading Factor below 0.6 and will be deleted from the construct analysis. The above results suggested good inner consistency among the items of this construct. Therefore, the construct is appropriate for further research.

V. Validity of the measurement through CFA

As per Saunders et al. (2011), a questionnaire's internal validity denotes its ability to measure what it intends to measure. According to Cooper and Schindle (2008, as cited in Saunders et al., 2011), the construct validity will be referred to as the validity of the overall questionnaire.

Construct validity

Construct validity is the extent to which measurement questions measure the presence of those constructs intended to be measured. (Saunders et al., 2011, p.373). It answers,' How well can measurement questions be generalized to the construct? Construct validity is also known as factorial validity (Field, 2009). Thus, factor analysis is needed to ensure the construct's validity. "Factor analysis is an interdependence technique, whose primary purpose is to define the underlying structure among the variables in the analysis" (Hair et al., 2010, p.94).

As per A-priori Sample Size Calculator for Structural Equation Models, under 0.05 significance level, the Minimum sample size for model structure is 138. However, in this study, the sample size is 163. Therefore, the sample size of the study met the minimum

requirement. According to Atkinson et al. (2011), confirmatory factor analysis (CFA) was performed with the aid of AMOS to assess the validity of the measurement of entrepreneurial education. According to Hair et al. (2010), the standardized factor loading estimates of the measurement model should be .5 or higher and, ideally, .7 or higher to ensure the construct validity. Accordingly, the standardized regression weights for all items in the measures are above .7, are significant under the 0.01 level, and reached the ideal situation (higher than .7). Therefore, this model did not delete a single item. It can be stated that these estimates denote that the indicators are related to the associated variables and approve the construct validity of the study.

Table 5: Standardized Regression Weights (Factor loadings)

			Estimate
GKEE1	<---	GenKnowEE	.833
GKEE2	<---	GenKnowEE	.793
GKEE3	<---	GenKnowEE	.805
GKEE4	<---	GenKnowEE	.734
GKEE5	<---	GenKnowEE	.811
GKEE7	<---	GenKnowEE	.855
GKEE8	<---	GenKnowEE	.867
MEE2	<---	MotivEE	.842
MEE3	<---	MotivEE	.860
MEE6	<---	MotivEE	.847
MEE8	<---	MotivEE	.874
MEE9	<---	MotivEE	.708
SEEE1	<---	SelfefficaEE	.653
SEEE2	<---	SelfefficaEE	.832
SEEE6	<---	SelfefficaEE	.801
SEEE7	<---	SelfefficaEE	.877
SEEE8	<---	SelfefficaEE	.813
SEEE9	<---	SelfefficaEE	.839
SEEE10	<---	SelfefficaEE	.866

Note: GKEE – General knowledge entrepreneurial education, MEE – Motivational entrepreneurial education, SEEE – self-efficacy-focused entrepreneurial education

The path diagram for each construct using AMOS, with the above-standardized regression Weights, is depicted in Figure 1.

Measurement Model Fit

Researchers must use the technique to ensure the specified model 'fits' the data. The selected model shows how sets of measured variables operationalize constructs and how the measured items represent a set of constructs. The Chi-Square value is a well-accepted measure in evaluating overall model fit and 'assesses the magnitude of difference between the sample and fixed covariance's matrices' (Hu & Bentler, 1999). A good model fit would deliver an insignificant result at a 0.05 threshold (McIntosh, 2007). The generally accepted cutoff criteria widely used to show model fit is • CFI ≥ 0.95 • TLI ≥ 0.95 • RMSEA < 0.06 to 0.08 • CMIN/DF < 3 to 5. Out of all, CMIN/DF is the most used index to ensure the model fit of the analysis. According to the output of the study, CMIN/DF is 1.943, which met the requirement as this value should be less than 03 in the ideal situation according to the above cutoff criteria. In addition, CFI, IFI, and TLI, approximately.95, show that the model fit is at the satisfactory stage of

the Study. Finally, we can conclude that this model has an adequate level of uni-dimensionality. The model fit summary of the analysis is as follows.

Table 6: Model Fit summary

CMIN/DF	1.943
GFI	.820
CFI	.938
TLI	.931
RMSEA	.076

Convergent Validity

Convergent validity considers whether two or more measures of the same concept (Construct) are highly related. Convergent validity can be ensured using the average variance extracted (AVE) and the Composite Reliability (CR) values. 'Stats Tools package' Excel software was used to get these values. According to the model's output, the composite reliability values of all three variables are more significant than 0.7, and all the AVE values of the three variables are more important than 0.5. Therefore, finally, it can be determined that the convergent validity of the three variables is satisfactory.

Table 7: Composite reliability values and Average variance extracted values

	Composite Reliability	The average variance extracted (AVE)
General Knowledge EE	0.916	0.686
Motivation EE	0.933	0.664
Self-efficacy EE	0.950	0.657

Note: General Knowledge E.E. – General knowledge entrepreneurial education, Motivation E.E. – Motivational entrepreneurial education, Self-efficacy E.E. – Self-efficacy focused entrepreneurial education.

VI. Discriminant validity

Discriminant validity evaluates the degree to which the measures of different constructs are distinct. The Fornell and Larcker Criterion (1981) was used to ensure this. According to this criterion, cross-loadings (variable loads on multiple factors) should differ by more than 0.2. Moreover, the AVE of each latent construct needs to be larger than the construct's highest squared correlation with any other latent construct. Furthermore, the correlation between factors should not exceed 0.7. Diagonal values in bold show the square root of the AVE value of its construct. The 'Stats Tools package' Excel software was used to get these values. The diagonal value of each column is greater than the correlation coefficient value between the constructs of each column. Finally, the discriminant validity problem is outside this model.

Table 8: Diagonal values and correlation coefficient between constructs

	GKEE	MEE	SEEE
GKEE	**0.876**		
MEE	0.625	**0.898**	
SEEE	0.618	0.757	**0.888**

Note: GKEE – General knowledge entrepreneurial education, MEE – Motivational entrepreneurial education, SEEE – Self-efficacy focused entrepreneurial education

Reliability of the measurement

Reliability is defined by Field (2009) as the ability of an instrument or a measure to be interpreted consistently across different situations. Further, it measures the degree to which a set of indicators of a latent construct is internally consistent in their measurements. Two types of reliability measures should be addressed in the measurement development process.

I.   Indicator reliability

II.   Internal consistency reliability

Indicator reliability

Indicator reliability can be ensured considering the significant factor loadings and the standardized loading estimates. The values of factor loadings and the standardized loading estimates should be greater than 0. 5 or, ideally, more significant than 0.7. According to the model's output, all factor loadings are significant under 0.01. Finally, it can be concluded that since all the indicators have small p-values, the Indicator reliability of the model can be ensured. The regression weight table, which shows a small p-value, is as follows.
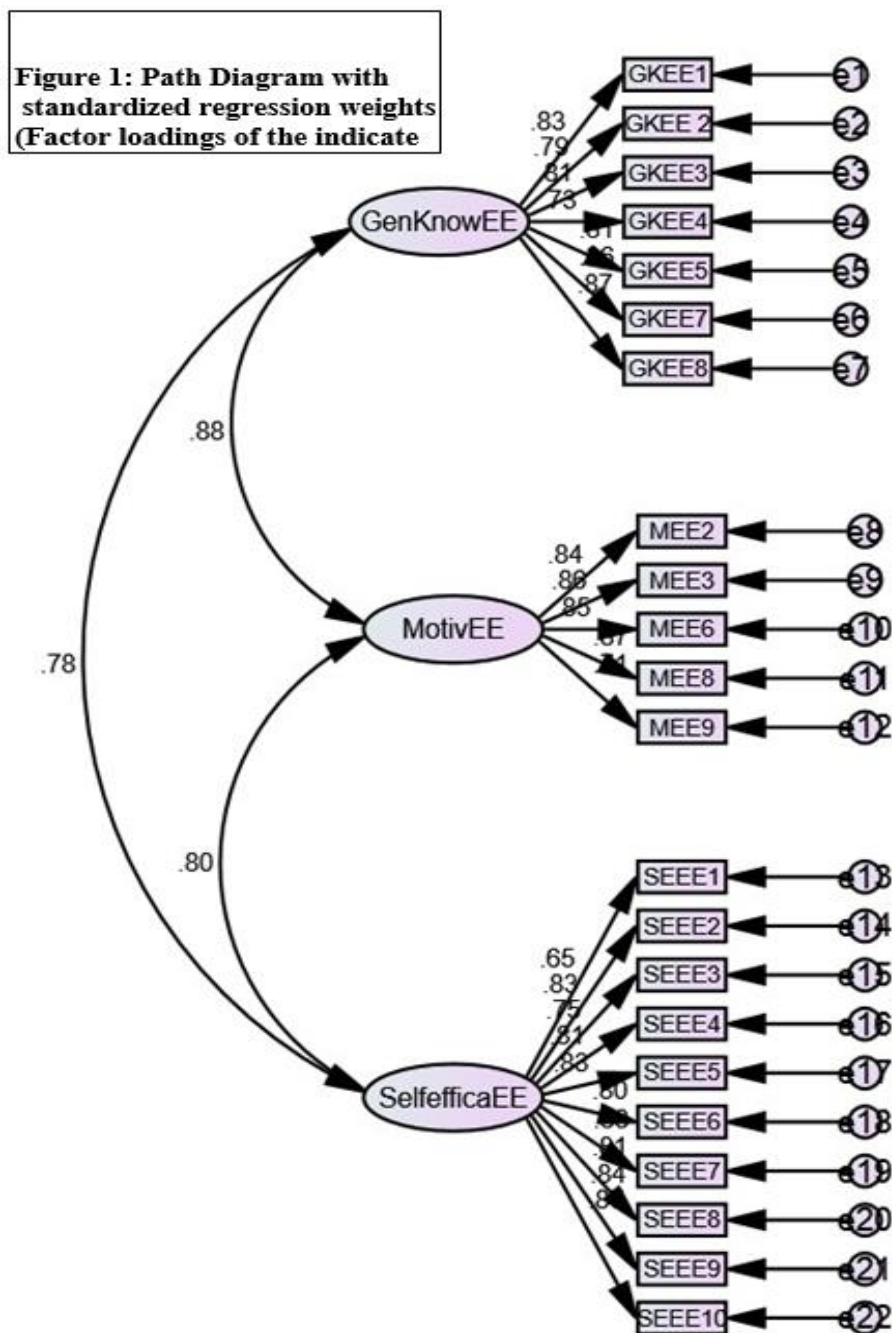

Figure 1: Path Diagram with standardized regression weights (Factor loadings of the indicate

Table 9: Regression Weights (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
GKEE1	<-	Gen Know EE	1.000				
GKEE2	<--	Gen Know EE	.984	.081	12.100	***	par_1
GKEE3	<--	Gen Know EE	1.024	.083	12.396	***	par_2
GKEE4	<--	Gen Know EE	.794	.073	10.823	***	par_3
GKEE5	<--	Gen Know EE	.853	.068	12.544	***	par_4
GKEE7	<--	Gen Know EE	.994	.073	13.643	***	par_5
GKEE8	<--	Gen Know EE	1.046	.075	13.950	***	par_6
MEE2	<--	Motiv EE	1.000				
MEE3	<--	Motiv EE	.979	.070	13.901	***	par_7
MEE6	<--	Motiv EE	.952	.070	13.562	***	par_8
MEE8	<--	Motiv EE	.998	.070	14.298	***	par_9
MEE9	<--	Motiv EE	.849	.082	10.333	***	par_10
SEEE1	<--	Selfeffica EE	1.000				
SEEE2	<--	Selfeffica EE	1.216	.131	9.287	***	par_11
SEEE3	<--	Selfeffica EE	1.072	.125	8.560	***	par_12
SEEE4	<--	Selfeffica EE	1.165	.128	9.128	***	par_13
SEEE5	<--	Selfeffica EE	1.276	.137	9.294	***	par_14
SEEE6	<--	Selfeffica EE	1.122	.125	9.008	***	par_15
SEEE7	<--	Selfeffica EE	1.195	.123	9.685	***	par_16
SEEE8	<--	Selfeffica EE	1.128	.124	9.115	***	par_17
SEEE9	<--	Selfeffica EE	1.188	.127	9.355	***	par_18
SEEE10	<--	Selfeffica EE	1.343	.140	9.593	***	par_19

Note: GKEE is general knowledge entrepreneurial education, MEE is motivational entrepreneurial education, and SEEE is self-efficacy-focused entrepreneurial education.

In Table 9, the Standardized regression weights (Factor loadings) are all larger than 0.7. Finally, it can be stated that a sufficient level of indicator reliability has already been established.

VII. Internal Consistency Reliability

Internal consistency reliability measures the consistency of people's responses across the items on a multiple-item measure. The variables' composite reliability and Cronbach alpha values can be considered to ensure internal consistency. Cronbach alpha is the most frequently used method and the most common measure of internal consistency. It is used primarily with multiple Likert questions in a survey/questionnaire. Lee Cronbach introduced this coefficient in 1951. The result of Cronbach alpha calculated for each measure is as follows.

Table 10. Reliability statistics of measures – Cronbach alpha

Measure	Cronbach alpha	Number of items
GKEE	0.932	07
MEE	0.915	05
SEEE	0.949	10

Note: GKEE – General knowledge entrepreneurial education, MEE – Motivational entrepreneurial education, SEEE – self-efficacy-focused entrepreneurial education

Table 10 shows that all the measures used are reliable, and all coefficients of actions are more significant than 0.7. If an item is deleted, the Cronbach's alpha of each step and the most considerable scale indicates that none of the things that demand deletions are required. These higher values of reliability resulted because of providing clear instructions to the respondents and enough items to measure each construct. Furthermore, Table 7 indicates that the composite reliability values of the three constructs are more significant than 0.7, meaning the internal consistency reliability of the measures.

Theoretical and practical implications

The theoretical contribution is to create a comprehensive definition of entrepreneurial education and a metric for measuring the construct. Due to the lack of a complete, timely definition and measurement for the entrepreneurial education construct, this study fills a knowledge gap in the entrepreneurial literature by providing a broad definition and a measurement with 22 items divided into three dimensions: general knowledge of entrepreneurial education, motivational entrepreneurial education, and self-efficacy focused entrepreneurial education. As a result, future researchers can empirically test the measurement mentioned above.

This can help them establish more effective policies supporting secondary and tertiary education, encouraging aspiring entrepreneurs to launch their businesses. Furthermore, policymakers at the school and university levels understand how they can help students develop an entrepreneurial mindset that will boost the country's economic growth by providing general knowledge on entrepreneurial education through appropriate curriculum and motivating them to be self-efficient in acquiring this knowledge. The study outcomes will also help educational institutions promote and encourage students' entrepreneurial goals and early entrepreneurial behavior.

The study's findings provide stakeholders, such as policymakers in charge of a country's entrepreneurial education, with a better knowledge of the essential components of entrepreneurial education. Understanding the supportive features of entrepreneurial education for launching a new business can help policymakers build more effective entrepreneurship-promoting policies. Moreover, these findings may aid the government in developing policies and programs to encourage university students to pursue entrepreneurial careers, reducing their reliance on traditional occupations and lowering unemployment.

VIII. Limitations of the study

The first limitation of the study is that the researchers only used a few databases for this investigation: Sage, Taylor & Francis Online, SpringerLink, ScienceDirect, Emerald, JSTOR, Scopus, and Research Gate EBSCO Host, and Wiley Online Library, all of which were published between 1991 and 2021. If this study had downloaded articles from additional databases, the conclusions would be far more rigorous than the findings.

Furthermore, for data collection, this study solely used an online questionnaire issued to 163 randomly selected management university students from renowned state universities in Sri Lanka's western province. Suppose data from other state universities covering management and non-managerial students, such as university students from other faculties like science, engineering, arts, and information technology, are collected. In that case, the conclusions will be more rigorous than the study's findings.

Furthermore, the researchers only looked at scholarly literature. Other publishing methods that could have been investigated include book chapters, conference proceedings, unpublished data, research group working papers, and technical reports. Following that, only publications written in English were considered for this study, with non-English documents being disregarded. The third constraint was that this study only looked at scholarly research articles published between 1991 and 2021, and this analysis did not examine academic research articles published before 1991 and after 2021. If these constraints were addressed, the results might be different and more representative.

IX. Discussion and conclusion

This study has investigated 28 descriptions of entrepreneurial education provided by different scholars. Referring to those definitions, This study has finally identified nine common characteristics through content analysis. This study has constructed a measurement scale for *Entrepreneurial education* using EFA and CFA with 22 items anchored in a five-point Likert scale under three aspects (Refer to Appendix 1). This study has contributed to the theoretical knowledge by providing a comprehensive definition of entrepreneurial education covering three critical dimensions. Most past research has provided narrow definitions focusing on narrow views. Further, most of the definitions are not timely definitions. Thus, the current study contributed to the entrepreneurial literature by adding a comprehensive definition of entrepreneurial education and proposing a measurement with empirical data.

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Appendices

Appendix 1

Developing a measurement for Entrepreneurial education of tertiary education in Sri Lanka

Please indicate your level of agreement on each statement from 1 (Strongly Disagreement) to 5 (Strongly agreement)

Strongly Agree	5
Agree	4
Neutral	3
Disagree	2
Strongly Disagree	1

GENERAL KNOWLEDGE OF ENTREPRENEURIAL EDUCATION

	Items	SD	D	N	A	SA
GKEE 1	My department mainly organizes entrepreneurial education.					
GKEE 2	My department has high involvement in entrepreneurial education.					
GKEE 3	My department arranges a specialized entrepreneurial program.					
GKEE 4	My department / the university has good books and other learning materials published on entrepreneurial education.					
GKEE 5	My department has a monitoring system for its entrepreneurial students.					
GKEE 6	Lecturers give their best to disseminate knowledge about the entrepreneurial environment.					
GKEE 7	My department creates an atmosphere to relate knowledge of theory and principles in the in-class activities of the entrepreneurial lectures.					

MOTIVATIONAL ENTREPRENEURIAL EDUCATION

	Items	SD	D	N	A	SA
MEE 1	My department assists the student in becoming more career advanced.					
MEE 2	My department constructs high self-esteem among the students through entrepreneurial educational programs.					
MEE 3	My department gives greater recognition of the entrepreneur's figure.					
MEE 4	My department provides platforms to interact with entrepreneurs and their role models.					
MEE 5	My department admires entrepreneurial parents.					

SELF-EFFICACY-FOCUSED ENTREPRENEURIAL EDUCATION

	Items	SD	D	N	A	SA
SEE 1	The present entrepreneurial education system in the university requires a substantial change to develop entrepreneurial qualities.					
SEE 2	My department Arranges more interaction with entrepreneurs.					
SEE 3	My department has collaborations with entrepreneurial development support agencies.					
SEE 4	Give more project work/assignments entrepreneurship.					

SEE 5	Give specialization in entrepreneurial development.					
SEE 6	Include more subjects from time to time in the syllabus.					
SEE 7	My department helps me to conduct feasibility studies for my business.					
SEE 8	My department helps me to develop a business plan for my business.					
SEE 9	My department encourages me to participate in entrepreneurial competitions in the country.					
SEE 10	My department encourages you to participate in the entrepreneurial internship.					