**Entrepreneurship education on Entrepreneurial Intention in Sri Lanka: The Measurement of Scientific Scale Development**

**Abstract**

The study explores the relationship between antecedents of entrepreneurial intention and entrepreneurial intention. Our study sample consisted of undergraduates who completed their studies in 2017, 2018, and 2019 from five state-owned national universities in Sri Lanka. An eligible criterion for selection of this sample was based on those who have a solid foundation of business-related knowledge. In order to minimize the margin error of 5percent, 740 commerce and management undergraduates were selected for the survey via multi-level mixed methods. Researchers used with entrepreneurial intention questionnaire (EIQ). Based on the sample 441 effective responses the analysis is performed by descriptive & inferential statistics using SPSS version 23and SEM Amos 23. Prior to the analysis, we verified the psychometric properties of the scales and model fitness. Consistent with earlier research, we found that scientific scale development (SSD) procedure could be adopted to confirm the seven key factors that influence entrepreneurial intention based on theoretical and empirical review. The discussions are presented with suggestions and recommendations for future scholars, highlighting the need of effective scale development and validity measures in entrepreneurial intention for self-employment.

***Keywords: Entrepreneurial Intention, Self-employment, Scientific Scale development,***

***Entrepreneurial intention questionnaire, Sri Lanka***

**1. Introduction**

Entrepreneurship has been considered as a crucial component of development and even part of the answer to the present economic problems in emerging nations as well as generally known as the potential trigger to drive progress in the periods of recession, where numerous negative consequences such as decline in growth rates, environmental issues, and unemployment are prevalent (Patricia et al,2016). It is widely acknowledged that university students are the primary driver of entrepreneurship. In order to assure university graduates’ survival in the real world, entrepreneurship education has been defined as one of the soft skills that is crucial (Hamza et al., 2016). As noted by Karimi et al. (2012) and Arshad et al. (2011) attracting graduates to pursue entrepreneurship is difficult because very few are self-employed, this has risen concerns (Bygrave, 1993; quoted in Muharam and Serah, 2014). Such, investigating students’ motivation and their cognitive profiles is challenging task.

On the other hand, individual perceptions or cognitions also function as the main explanatory mechanism for the development of intentions across all theories (Alhaji, 2015) and students’ perceptions of entrepreneurship education (EE) for self-employment as desirable positive career choices were noticed by a few (Hattab, 2014). This means entrepreneurial traits such as self-employment intention can be influenced by entrepreneurship education (Gorman et al., 1997; quoted in Muhuram and Serah, 2014).

In entrepreneurial literature, we find that intention is the best predictor of the behavior of entrepreneurs; it is also the first step in understanding and implementing the process of entrepreneurship. Also, respondents from developing countries score higher on the theory’s antecedents of entrepreneurial intentions—attitudes towards entrepreneurship (ATT), subjective norms (SN), and perceived behavior control (PBC)—than respondents from developed countries (Iakovleva et al,2011). Furthermore, EE has been recognized as an exogenous factor that may shape an individual’s cognitive process for self-employment intention (Alhaji 2015:57). A person’s perceived entrepreneurial motivation (PEM) refers to their beliefs related to how attractive the idea of selecting an entrepreneurial career path in a specific country can be (Solesvik, 2013; 257).

On the other hand, the researchers highlight the salient fact that desirability for self-employment or perceived entrepreneurial motivation have a substantial association with SEI (Achchuthan & Nimalathasan, 2014; Dankanda & Madurapperuma, 2018). In order to better reflect the mind, set of Sri Lankan potential entrepreneurs, a new variable with the name attitude towards entrepreneurship education (ATTE) has been added to the combination of perceived professional attraction (ProfA) and personal attitude (ATT) despite the perceived constraints and barriers (Survey data, 2017-2019)

**Educated Youth**

Youth as a group are much more entrepreneurial than adults according to the GEM study report (2012–2014). The researchers study focus is on educated youth, defined as ‘entrepreneurial youth, ‘and their age group is categorized under the age range of 20 to 34 years. This is most obvious explanation for the phenomenon; further this entrepreneurial age group range is determined by three criteria: differences in inter-generational, gender, and geographical inequalities, as by GEM Surveys (2012-2014). So, in this study, university's role in stimulating the practice of entrepreneurship is examined.

University students have been tested on entrepreneurial intention (EI) by a number of researchers (Gird & Bagraim, 2008; Ummah, 2009; Linan and Chen, 2009; Muhuram and Sera, 2014; Malebana and Swanepoel, 2015) and these research’ findings support entrepreneurship education teaching methodologies and policy development (Linan et al., 2013; Muhuram & Sera, 2014; Malebana & Swanepoel, 2015) and as a result, entrepreneurship education is a rapidly expanding field in colleges and universities all around the world.

Since there is dearth of literature to identify the steps in scale development and validation, with this study researchers attempt to fill the empirical gap by studying the entrepreneurial intention questionnaire (EIQ) in Sri Lankan setting.

**Figure 1: Profile of the respondents**

**Source: Survey Data (2017-2019)**

**2. Profile of the Respondents**

Graduates enrolled in the compulsory and optional courses in EE distributed as per following manner: Module or chapters of a module and as a special degree. In terms of entrepreneurial youth (aged 20 to 34), 98 percent of the respondents fell under the youth category only 7percent reported being self-employed, on the other hand 59 percent confirmed that they are sound in entrepreneurial knowledge, while 28 percent are influenced by entrepreneurial parents., representing 38 percent are males and 62 percent are females. In short, the researchers, found that university type (ODL or conventional) remains as an excluded variable’ (Source Survey Data,2016-2020).

**3.Materials and Methods**

Quantitative research design is employed in the study. This study is based on a cross-sectional survey that took place in December 2017–2019. The sampling method of the study is based on multi-level mixed methods (Acharya et al., 2013; Teddlie & Fen, 2016; Dankanda & Madurapperuma,2018). Eligible criteria for selection of this sample were those admitted in 2014 to state-owned national universities and who are in the management or commerce stream and followed EE with a solid foundation of business-related knowledge.

To minimize the sampling error of 5%, the primary data has been distributed using a self-administered questionnaire among 740 graduates from five state owned national universities in Sri Lanka., yielding a response rate of 60 percent.

To identify, the seven key components of independent (PEM), mediating (ATTE, SN, and PBC), moderating variables (EE, Const.), dependent variable (EI) of the tested results of the study are as follows:

**4.Scale Development Procedure**

For the present study, a scientific scale development procedure was adopted (Rossiter, 2002; Schwab, 1980; Ali et al., 2021). According to Schwab (1980), scale development and validation required three phases: item development, scale development with the use of exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). In the finally phase scale evaluation, and validation which included the psychometric examination of the new measure (see figure:2).

**Fig.2 .** **Three phases of scale development and validation**

# 4. RESULTS AND DISCUSSION

**4.1 The Instrument**

**After examining the reliability of variables by Cronbach’s alpha, the researcher seven** key factors that influence entrepreneurial intention based on theoretical and empirical review were selected for the design of the structured questionnaire (Liñán & Chen (2006, 2009); Linan & Rodriguez (2016); Olufunso (2010); Turker & Selcuk (2009); Solesvik (2013).

**4.1.1 Test for Reliability:** The data collected through the structured questionnaire is designed to collect data on a seven-point Likert scale-type measurement scale. This scale will be subsequently converted to a five-point Likert scale to ensure consistency of data.

Before preceding the main survey, the researcher conducted validity and reliability tests and found that the first output was 441 units, while the missing data was zero, thus all the data was processed.

Additionally, a questionnaire is generally accepted as reliable when the Cronbach’s alpha is higher than 0.8(Hair etal,2010). Thus, the main survey output of reliability statistics obtained by Cronbach’s Alpha (α) shows good reliability, and the result clarifies a clear indicator:

**4.1.2 Exploratory Factor Analysis**

According to anearly study by Ronnie (1997) factor analysis is a technique to identifying the number and nature of the variables; these factors are either hypothetical or explanatory constructs or variables. In order to validate items in the questionnaire, large data sets that consist of several variables could be reduced by observing groups or variables (Yong & Pearce, 2013). However, the validity of the questionnaire cannot be interpreted based on the factor analysis alone (Bornstedt, 1977; Ratray & Jones, 2007 as quoted in Hof 2012, p. 10) Also, according to Costello and Osborne (2005), the two forms of EFA are Factor Analysis (FA) and Principal Component Analysis (PCA). ‘PCA’ is only a data reduction method and produces 'components whereas factor analysis is a mathematically complex, many researchers use this for study validations.

Recent studies widely use the term ‘EFA’ (Costello & Osborne, 2005). The linear combinations of variables that explore interrelationships must be determined, along with brief interpretations. To ensure the reliability of the factors as well as achieving the predetermined goals “researchers needed to conduct studies with larger samples at a specific point in time (Yong & Pearce, 2013:81)".

As discussed, all measures of the EI questionnaire were adapted from prior studies and subject to Meta analytic path analysis using SPSS 23 and AMOS 23. The seven domains of the EIQ questionnaire contain a total of 22 items (which cover seven related constructs, including (CONST). Elgin values greater than one were extracted and retained whereas items that did not exceed 0.5 and cross-loaded statements were deleted (Chan & Idris, 2017; Duong, 2021).

|  |  |  |
| --- | --- | --- |
| **Table 1. KMO and Bartlett's Test** | | |
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .903 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 6296 |
| Df | 231 |
| Sig. | .000 |

Source: Survey Data (2017)

(I)Those items that are lower (EE2, PEM5, CONST2, ATT1, ProfA1, ProfA2, ProfA3, ProfA4, Prof5, SN4, PBC2, PBC6, PBC7, EI1, SEI3) are extracted from the scales. Consequently, the researcher eliminated all cross-loaded items (CONST1, CONST3, ATT3, SN1, SN5, SN6, PBC5, EI2, SEI1, SEI2) and

(2) The result indicates: - that all the remaining 22 factor loadings met the acceptable criteria, such as above 0.70 (Charbaji, 2017; Chan & Idris 2017:402), and the eight factors, according to the table above (where KMO = 0.903, Sig (Bartlett’s test) = 0.000 (0.001), and initial Elgin values = 79 percent > 50%, this suggests that the cumulative variance of the eight factors is greater than 50percent.

After studying the Elgin values, the researcher identifies that the first factor accounts for 41.044% of the variance, the second for 9.420%, the third for 7.506%, the fourth for 6.308%, the fifth for 5.617, the sixth 4.892%, the seventh for 4.089% and the eight factors for 2.390% (Duong, 2021:161; Chan & Idris, 2017:406)., which contributes to entrepreneurial intention. The factor correlation matrix provides the estimated correlation between two extracted factors, as noted by Newsom (2020:4).

In other words, if the correlation is zero, the rotated and un-rotated solutions are the same. This means that if the correlation is larger, the difference between the factor and pattern matrices will be larger. As a result, the researcher finalized the dataset with the highest number of valid cases while suppressing small coefficients’ (<0.05), emphasizing the ‘appropriate requirements of the reliability and factor analysis (Survey Data, 2016–2020), 22 items are employed for factor analysis. See tables 2 **& 3**

**Table 2. Reliability and Factor Loadings of the Questionnaire**

|  |  |  |  |
| --- | --- | --- | --- |
| **Prominent Construct /items in**  **descending order** | **Questions** | **Communalities** | Cronbach’s Alpha (α) |
| **Entrepreneurship education**  **EE-04** | To develop  EE1-Knowledge about the entrepreneurial environment  EE3-The preference to be an entrepreneur  EE4-The necessary abilities to be an entrepreneur  EE5-The intention to be an entrepreneur | EE1-0.763  EE3-0.821  EE4-0.853  EE5-0.820 | **0.917** |
| **Perceived entrepreneurial motivation**  **PEM-04** | PEM1-Most People: Consider investigating in their own business and its management desirable career choice-  PEM2-To be free & independent  PEM3-They have good ideas and want to realize them  PEM4-To better off financially | PEM1-0.757  PEM2-0.770  PEM3-0.785  PEM4-0.742 | **0.886** |
| **Attitude towards entrepreneurship education**  **ATTE-04** | After finishing your degree your choice  Considering all advantages and disadvantages (economic, personal, social recognition, and so on) your level of attraction towards Professional choice ProfA6-Entrepreneur  ATT2-A career as an entrepreneur is attractive to me  ATT4-Among various options I’d rather be an entrepreneur  ATT5-Being an entrepreneur would entail great satisfaction for me | ProfA6-0.614  ATT2-0.756  ATT4-0.736  ATT5-0.692 | **0.841** |
| **Subjective norms**  **SN-02** | If you decide to become an entrepreneur who would approve your choice- SN2-People important to you  SN3-Your colleagues & mates | SN2-0.881  SN3-0.841 | **0.843** |
| **Perceived behaviour control**  **PBC-03** | PBC1-Start a firm and keep it working would be easy for me  PBC3- I can control the creation process of a firm  PBC4--I am prepared to start a viable firm | PBC1-0.789  PBC3-0.704  PBC4-0.779 | **0.823** |
| **Entrepreneurial intention**  **EI-03** | EI3-I have very seriously thought of starting a firm  EI4-I am determined to create a business venture in the future  EI5-I have got an intention to start a firm one day | EI3-0.842  EI4-0.800  EI5-0.852 | **0.895** |
| **Perceived constraints & barriers**  **CONST-02** | There are few circumstances beyond my control  CONST4-Capital  CONST5-Resources | CONST4-0.881  CONST5-0.874 | **0.861** |
| **Tot items 22** |  | **Tot items 22** |  |
| **KMO and Bartlett’s Test** |  |  | **0.903** |
| Bartlett’s Test for Sphericity Significance |  |  | **0.000** |
| **Cumulative variance** |  |  | **79%** |
| There are 26 non-redundant residuals with absolute values that are greater than 0.05, | **(This indicates that ‘As a rule of thumb a model that is a Good Data Fit will have less than 50% non-redundant residuals with absolute values that are greater than 0.05(Morse,2019)** |  | **11%** |

**Source: Survey Data (2017-2018)**

**Table 3. Pattern Matrix**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Pattern Matrixa** | | | | | | | |
|  | Component | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| EE4 | .944 |  |  |  |  |  |  |
| EE5 | .887 |  |  |  |  |  |  |
| EE1 | .870 |  |  |  |  |  |  |
| EE3 | .863 |  |  |  |  |  |  |
| PEM3 |  | .900 |  |  |  |  |  |
| PEM2 |  | .884 |  |  |  |  |  |
| PEM1 |  | .848 |  |  |  |  |  |
| PEM4 |  | .761 |  |  |  |  |  |
| ATT2 |  |  | .927 |  |  |  |  |
| ATT4 |  |  | .837 |  |  |  |  |
| ATT5 |  |  | .722 |  |  |  |  |
| ProfA6 |  |  | .676 |  |  |  |  |
| EI5 |  |  |  | .947 |  |  |  |
| EI3 |  |  |  | .876 |  |  |  |
| EI4 |  |  |  | .817 |  |  |  |
| PBC1 |  |  |  |  | .876 |  |  |
| PBC4 |  |  |  |  | .815 |  |  |
| PBC3 |  |  |  |  | .789 |  |  |
| CONST5 |  |  |  |  |  | .949 |  |
| CONST4 |  |  |  |  |  | .902 |  |
| SN2 |  |  |  |  |  |  | .963 |
| SN3 |  |  |  |  |  |  | .832 |
| Extraction Method: Principal Component Analysis.  Rotation Method: Promax with Kaiser Normalization.a | | | | | | | |
| a. Rotation converged in 6 iterations. | | | | | | | |

**4.1.3 Psychometric properties of the Scales**

Prior to the analysis we have verified the psychometric properties of the scales for the constructs, this suggested that the researchers perform an exploratory factor analysis and the reliability and validity of all scales have been examined via Cronbach’s alpha and confirmatory factor analysis (CFA) (Hair *et al.*, 2020; Duong et al,2022).

On the other hand, the measurement model is used for final instrument validation, while the structural model is used for testing the associations’ hypotheses in the research model. Thus, confirmatory factor analysis (CFA) was used to further analyze all metrics (Duong, 2021:159).

**Table 4. Dropped (Removed & deleted items prior to CFA)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Construct** | **Dropped (Removed & deleted statements/Items)** | **Source** | **Dropped items** | **Retained Items** |
| Entrepreneurship education-EE  (04 items) | EE type/ Course  EE2-Greater recognition of the entrepreneur’s figure | Linan & Rodríguez, 2016 | EE type/  Course  EE2 | EE1  EE3  EE4  EE5 |
| Perceived constraints & barriers-CONST  (02 items) | There are few circumstances beyond my control  CONST1-Financial  CONST2-Industrial internship through University/Govt. intervention  CONST3-Time | Olufunso (2010) | CONST1  CONST2  CONST3 | CONST4  CONST5 |
| Perceived entrepreneurial motivation  PEM (04 items) | PEM5-To be Successful | Solesvik (2013) | PEM5 | PEM1  PEM2  PEM3  PEM4 |
| Attitude towards entrepreneurship education-ATTE  (04 items) | After finishing your degree your choice  ProfA1-Working as an employee  ProfA2-Starting up a firm  ProfA3-Follow on Training & Preparation  Considering all advantages and disadvantage your choice ProfA4-Salaried work; ProfA5-Govt.employee  ATT1-Being an entrepreneur implies more advantage than disadvantages to me  ATT3-If I had the opportunity and resources, I ‘d like to start a firm | Liñán &Chen 2006-2009; Linan & Rodríguez, 2016 | ProfA1  ProfA2  ProfA3  ProfA4  ProfA5  ATT1  ATT3 | ProfA6  ATT2  ATT4  ATT5 |
| Subjective norms-SN  (02 items) | If you decide to become an entrepreneur who would approve your choice- SN1-Your friends, and  If I decide to set up a business who would approve of my choice.  SN4-Your friends, SN5-Close family .SN6-Your Colleagues & mates. | Liñán &Chen 2006-2009; Linan & Rodríguez, 2016 | SN1  SN4  SN5  SN6 | SN2  SN3 |
| Perceived behaviour control-PBC  (03 items) | PBC2- I am prepared to do anything to be an entrepreneur  PBC5-I know the necessary practical details to start a firm  PBC6-I would have complete control over the situation if I run a business  PBC7-If I tried to start a firm, I would have a high probability of succeeding | Liñán &Chen 2006-2009; Linan & Rodríguez, 2016 | PBC2  PBC5  PBC6  PBC7 | PBC1  PBC3  PBC4 |
| Entrepreneurial intention  EI  (03 items) | EI1-I am ready to make anything to be an entrepreneur  EI2-My professional goal is becoming an entrepreneur | Liñán &Chen 2006-2009; Linan & Rodríguez, 2016 | EI1  EI2 | EI3  EI4  EI5 |
| Self-employment Intention  SEI (no items) | SEI1-I have got the intention to start the firm in the next 2yrs  SEI2-I have got the intention to start firm in the next 2 to 5yrs  SEI3- I intend to start a firm with in 5yrs after graduation | Liñán &Chen 2006-2009; Linan & Rodríguez, 2016 | SEI1  SEI2  SEI3 | - |
| **Total finalized items 22** | **Initial Total items prior to main survey -47** |  | **Dropped items 25** | **Retained**  **Tot items 22** |

Source: Survey Data (2017-2020)

**4.1.4 Confirmatory Factor Analysis (CFA)**

**Confirmatory Factor Analysis (CFA)** is a multivariate statistical procedure that assesses the applicability of the soundness of variables, which represent the number of constructs. CFA can be identified as a theory-driven tool that is employed to confirm or reject the measurement model. The model fitness criterion for CFA and is very much popular as well as acknowledged by many (Malkanthi, 2015; Jain& Chetty, 2022).

The most obvious explanation is that a well-fitted model ensures consistency and prevents re-working. Thus, it is essential to examine model fitness before assessing the linkage between variables (Kenny, 2020; Shi & Lee, 2019; Jain& Chetty, 2022).

The researcher examined the model fitness and the results are shown below.

According to a recent study, Koyuncu and Kilic (2019), discovered parsimony goodness fit indices have been identified as acceptable model fit indices. Please see the table 5, for fit indices and acceptable cut-off points (Jain & Chetty, 2022).

**Table 5. Fit indices and acceptable cut off points**

|  |  |  |
| --- | --- | --- |
| **Model Fit indices** | **Acceptable standard** | **Interpretation** |
| X 2 /SD | (1) Value greater than 0.5  (2) value between 2 to 5 | Good Fit  Acceptable |
| Chi –Square (X 2) | P value>0.05 | Acceptable Fit |
| Goodness of fit (GFI)  Baseline comparisons | Value closer to One | Good Fit |
| NFI (Normed Fit Index) | (1) Value closer to One  (2) value up to 0.08 | Good Fit  Acceptable |
| IFI | Value 0.90 | Good Fit |
| TLI (Tucker –Lewis) | Values 0.90 | Good Fit |
| CFI (Comparative Fit Index) | (1) Value closer to One  (2) value bet0.90 to 0.95 | Good Fit  Acceptable |
| Parsimony goodness of fit-PNFI | Value closer to One is a perfect fit | Compare values in alternative models |
| RMSEA | Value less than 0.05 | Good Fit |

Source: (Adapted from Schumacker, 2010; Koyuncu & Kilic, 2019)

According to the findings, most of the indices’ absolute fitness values are within acceptable bounds and satisfy necessary criteria (Jain & Chetty, 2022; Gaskin & Lim, 2016). As stated, when looking more closely at the data of the first measurement model, level of significance value, and freedom, at least one of the criteria must be reported, and CFI is closer to one (Koyuncu & Kilic, 2019:379). The most obvious explanation is that the researcher uses combination of CFI>0.95, SRMR<0.08, and RMSEA<0.06 to solidify evidence in accordance with Hu and Bentler (1999) “cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives”, which recommend integrating different metrics (Gaskin & Lim, 2016).

# 5.Measurement Model

Upon examining the appropriateness of the data and the validity and reliability of constructs in the conceptual framework before testing hypotheses, both Cronbach’s alpha and CFA were simultaneously carried out in our study. Firstly, Cronbach’s alpha of all variables was higher than the cut-off value and amounted to 0.63 (Hair *et al.*, 2020) (Table 6/Fig. 3). Second, CFA results also reported that the seven-factor measurement model with 22 items represented a great fit: CMIN/df = 2.481; p < 0.001; GFI = 0.911; AGFI = 0.880; CFI = 0.955; TLI =0.945; NFI = 0.927; and RMSEA = 0.058 (Hair *et al.*, 2020; Szostek *et al*., 2020; 2022). , Figure 3 showed that the standardized regression weights of all items were much higher than the cut-off value of 0.5 (Nguyen *et al.*, 2022).

Table 6 illustrates the Pearson correlation matrix, composite reliability (CR), average variance extracted (AVE), and the square roots of AVE of all variables. AVE and CR values were higher than the threshold values of 0.5 and 0.7, respectively.

Moreover, the maximum shared variance (MSV) values of all variables were found to be lower than their AVEs, while all values of correlation coefficients were less than their square root of AVE (in bold). Thus, the reliability and validity of all scales were demonstrated and appropriate for processing to test hypotheses.

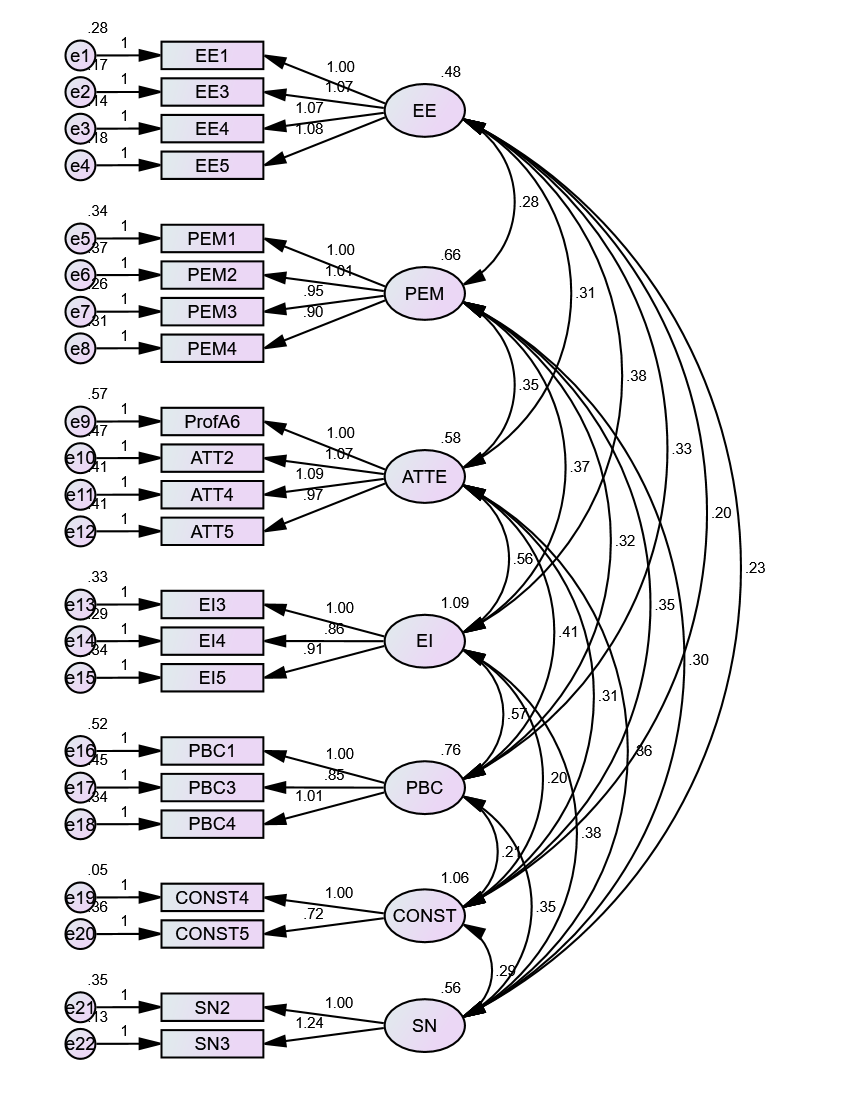


Figure 3. First Order CFA measurement model

# Table 6: Model Validity Measures

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Construct** | **CR** | **AVE** | **MaxR(H)** | **EE** | **PEM** | **ATTE** | **EI** | **PBC** | **CONST** | **SN** |
| **EE** | 0.918 | 0.737 | 0.922 | **0.858** |  |  |  |  |  |  |
| **PEM** | 0.887 | 0.663 | 0.888 | 0.506\*\*\* | **0.814** |  |  |  |  |  |
| **ATTE** | 0.843 | 0.574 | 0.846 | 0.593\*\*\* | 0.564\*\*\* | **0.758** |  |  |  |  |
| **EI** | 0.897 | 0.743 | 0.897 | 0.525\*\*\* | 0.438\*\*\* | 0.702\*\*\* | **0.862** |  |  |  |
| **PBC** | 0.825 | 0.611 | 0.831 | 0.547\*\*\* | 0.455\*\*\* | 0.611\*\*\* | 0.623\*\*\* | **0.782** |  |  |
| **CONST** | 0.874 | 0.779 | 0.954 | 0.287\*\*\* | 0.417\*\*\* | 0.389\*\*\* | 0.184\*\*\* | 0.235\*\*\* | **0.883** |  |
| **SN** | 0.850 | 0.741 | 0.892 | 0.454\*\*\* | 0.486\*\*\* | 0.626\*\*\* | 0.483\*\*\* | 0.536\*\*\* | 0.372\*\*\* | **0.861** |

Source: adapted from Gaskin, J.& Lim, J. (2016)’\*\*\*p<0.001based on Survey Data:2017-18

**Internal Consistency**: Cronbach alpha values for all variables are more than 0.8., according to EFA, as a result the model has internal consistency, on the other hand, the method for assessing the contribution or significance of an item by examining the factors loading is defined as **composite reliability (CR)**. Looking at theTable 6 demonstrates that a CR value for all scales is higher than 0.80. Thus, composite reliability is derived for the model (Duong**,** 2021:161; Jain & Chetty, 2022)..

Also, the researcher computed **average variance extracted (AVE) to** understand the convergent validity of all constructs. To demonstrate discriminant validity, AVE estimates should also be greater than the square of the correlation between that factor and other factors. As all AVE values are within the recommended level, with a value higher than 0.60. Thus, the model provides evidence that each variable has discriminant validity (Duong**,** 2021:161; Jain & Chetty, 2022).

Moreover, the first order measurement model suggests that there are seven dimensions(constructs), i.e.: (CONST, ATTE, SN, PBC, PEM and EE). which are independent in their prediction of entrepreneurial intention (EI). The constructs EE (EE1, EE3, EE4, EE5), PEM (PEM1, PEM2.PEM3. PEM4) and

ATTE (ProfA6, ATTE2, ATTE4, ATTE5) are measured by four items and the constructs, EI (EI3, EI4, EI5), PBC (PBC1, PBC3, PBC4), are measured by three items, whereas constructs CONST (CONST4, CONST5), SN (SN2, SN3) measured by two items.

**6.Conclusion**

**Table 7. Conclusion Summary of construct reliability & convergent Validity**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test Category** | **Pilot (Average)** | **Pre-Test** | **Main Survey** | **Best Fit Model** |
| **Construct Reliability**  All factor reliability | >0.6 | >0.6 | >0.8 | **Internal reliability acceptable** |
| **EFA** |  |  |  |  |
|  |  |  |  |  |
| **KMO and Bartlett’s Test** (sample adequacy) | 0.813 | 0.801 | 0.903 | **Convergent validity criteria are met** |
| Bartlett’s Test for Sphericity Significance | 0.000 | 0.000 | 0.000 |  |
| **Cumulative variance** | 64% | 79% | 79% |  |
| **All factor loadings** |  | Accepted Level | Accepted Level |  |
| **Higher likelihood of validity with multiple designs and measures** | Instrument will be pre-tested with two sub samples, prior to the main survey | There are 40 non redundant residuals with absolute values > 0.05, | There are 26 non redundant residuals with absolute values> 0.05, |  |
| Statistical validity tests (Pilot/Pre-test) in acceptable standard and data are valid for further analysis –  **Convergent validity** |  | **Pre-test have less than 50% non-redundant residuals with absolute values that are greater than 0.05=14%** | **Main survey has less than 50% non-redundant residuals with absolute values that are greater than 0.05=11%** | **Good Data Fit** |

Source: Survey Data (2016-2020)

As discussed, all measures of the EI questionnaire were adapted from prior studies and are subject to factor analysis (Duong, 2021). The most logical explanation is that the researcher has used a variety of techniques to evaluate the instrument prior to performing the final factor analysis in EFA and CFA, including different ways of determining empirical validity such as convergent and criterion validation (Ranasinghe & Fonseka, 2011:39).

This suggested that when the instrument was finalized at the pilot, pre-testing, and EFA prior to CFA, the researchers examined different indicators of the same variable and yielded similar results the findings demonstrate that the criterion validity increases with the number of tests an indicator passes with respect to a different set of samples (Ranasinghe & Fonseka, 2011:40).

On the other hand, the measurement model is used for final instrument validation, while the structural model is used for testing the associations’ hypotheses in the research model. Thus, confirmatory factor analysis (CFA) was used to further analyze all metrics (Duong, 2021:159).

**External variable effect:**

Entrepreneurial knowledge ‘is one of the important elements prior to receiving entrepreneurship education, according to a number of studies (Linan, 2004; Turker& Selcuk, 2009). After evaluating the reliability and validity of the variables, researchers added entrepreneurial knowledge as one of the control variables other than gender, age, and parental self-employment. The survey data from 2017–2019 indicated that institutional variables (university type, degree level, and GRAD year) have been identified as excluded or insignificant variables.

**Limitations and Further research**

The study is limited to 441 graduates registered at five state-owned national universities covering the Western, Uva, Eastern and Northern provinces. Researchers’ attempt to explore the methodology for effective scale development and validity measures in entrepreneurial intention for self-employment generated interest for further studies that enrich data purification and repeat validity measures in confirmatory factor analysis (CFA) to find direct, indirect effects with second order measurement and structural model.

**Consistence of the obtained results of the study**

As per our knowledge, this will be the first empirical study carried out in Sri Lanka with respect to highlighting the importance of scale development and validity measures in entrepreneurial intention (EI) of graduates who completed their respective studies in 2017, 2018, and 2019.

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