A Structural Equation Modelling of Entrepreneurial Education and Entrepreneurial Intensions Among Malaysian University Students

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ABSTRACT: The purpose of this study is to propose a hypothesised model for the research topic and describe the methodology by using Structural Equation Modelling. The research topic is 'effectiveness of entrepreneurship education in developing entrepreneurial intentions among Malaysian University students'. Entrepreneurship education has been the focus in developing intentions and it has been proven by many researchers as the primary predictor of future entrepreneurial behaviour among university students. Structural equation modelling is selected for this study as the researcher is interested in studying the theoretical constructs that cannot be observed. Entrepreneurial intention is the dependent variable in this study and it could be called 'latent' or 'unobservable' variable. Since latent variables are not observed directly they cannot be measured directly. A hypothesised model developed for the study has to be tested through Amos version 22.0. Statistically in an analysis of the entire system of variables, the aim is to determine the extent to which it is consistent with the data. If the model fits adequately it is found to be plausible of postulated relations among the variables. If it is inadequate, then the testability of the relation is rejected and a new model has to be generated.

KEYWORDS:Entrepreneurship Education, Entrepreneurial Intentions, Hypothesised Model, Structural Equation Modelling

I. INTRODUCTION

Structural Equation Modelling is one of the most widely used methods for analysing multivariate data in the social and behavioural sciences. SEM is a comprehensive statistical approach to test hypotheses about relations among observable and latent variables. SEM theory appeared as early as 1970's (Jöreskog 1973; Keesling 1972; Wiley 1973). Recently it has received an increasing interest as a standard approach to testing research hypotheses with the complexity of the research questions in the social and behavioural sciences (Hoyle 1994a; Reis & Stiller 1992) with the user-friendly computer software (Bentler 1992a; Jöreskog & Sörbom 1993a; Muthèn 1988). The research examines the effectiveness of entrepreneurship education in developing entrepreneurial intentions among Malaysian university students. Entrepreneurial intention is a latent or unobservable variable and accordingly the research methodology proposed is Structural Equation Modelling (SEM). The SEM approach to research design is similar to standard approaches like correlation, multiple regressions, and ANOVA, but is more powerful and robust since it includes the modelling of interactions, nonlinearities, correlated independents, measurement error, correlated error terms; multiple latent independents each measured by multiple indicators and one or more latent dependents also each with multiple indicators. It is considered as a powerful alternative to path analysis, time series analysis and covariance analysis and is an extension of the general linear model of which multiple regressions is a part. SEM is a confirmatory rather than an exploratory procedure. The research designsupports a realism paradigm as the theory is tested through hypotheses using the SEM methodology. It is a descriptive research and also supports a causal research as the hypotheses in the proposed model are tested. It adopts a quantitative methodology using a questionnaire survey to validate the model on entrepreneurial intentions. The questionnaire is used as a pre-test for the pilot study of 30 respondents. The tool that has been proposed in this SEM methodology is AMOS 22.0. Through confirmatory factor analysis, the observed measures and the underlying factors are tested to determine the adequacy of the goodness in the sample data. The model testing procedure is to determine the goodness of fit between the hypothesized model and the sample data (Byrne 2013).

II. RESEARCH METHODOLOGY

The research supports a realism approach as it uses structural equation modelling (Healy & Perry 2000, p.120). The realism paradigm permits building theory and hypotheses for testing using in-depth surveys using multi-item probe questions to determine latent factors of entrepreneurial intentions through entrepreneurship education. SEM is applied to the data collected either to support or refute the hypotheses (Creswell 2007).

Descriptive research is used as it aims to gather a large sample of data from the respondents in order to put forward a general theory to test of hypotheses, rather than from an individual perspective. It is used to describe the characteristics of data collected from the survey, such as frequency of occurrence of phenomena, charts and standard deviations. A structured questionnaire and an appropriate sample are used in the survey (Kinnear et al. 1993). However descriptive research has its limitations and fails to establish direct cause-and-effect relationship between the research variables. Hence, causal research is carried out to provide the researcher with a controlled environment where the independent variables are used to test the hypotheses about the dependent variables (Zikmund 2010). Statistical tools like correlation and regression techniques and structural equation modelling areproposed to analyse the data. The research uses SPSS version 22.0 and AMOS version 22.0 to test the hypotheses and analyse the data. The research adopts a quantitative methodology as it aims to gather data from a large number of subjects in order to measure and validate the model on entrepreneurial intentions. The research approach helps to understand the relationship of independent variables (entrepreneurship curricula, teaching methodologies, and university's role in promoting entrepreneurship), and the mediating variables (attitude and stake holder support factors) against the dependent variable entrepreneurial intentions. The approach of the methodology is to analyse the data through statistical methods, of using tables and charts and to measure the relationship of the variables (Neuman 2010; Creswell 2007). The sampling technique selected is probability sampling as this method helps to reduce bias (Zikmund 2010). The population is divided in subgroups of business and information technology students. Hence stratified sampling has been found to be more efficient method. A survey questionnaire has been designed to gather primary data from the respondents to test the hypotheses and the proposed hypothesised model.

III. RESEARCH DESIGN

The research design investigates the research questions and the research problems. The proposed model in Fig.1.1 shows the development of five hypotheses to explain the entrepreneurial intentions among the Malaysian university students. A survey questionnaire was designed from a representative sample. Before the collection of data from the sample population, a pilot study was proposed to collect data from the ultimate subject of the research projects to serve as a guide for the larger study. The pilot study is a 'small-scale exploratory research technique that uses sampling but does not apply rigorous standards' (Zikmund 2010). The primary data from the pilot study was found to be useful for the conduct of a situational analysis and pre-testing the survey questionnaires.

Operational constructs : The operational definitions of constructs in the research model are examined to measure the hypothesised relationships and to explain how the interval scale is devised for the questionnaire (Perry 2001). The development of well-constructed measurement procedure is critical to the process of collecting the research data. It consists of two processes: construct development and scale measurement (Hair, Bush &Ortinau 2004). The construct development process identifies what has to be measured including dimensionality traits. Through the process of operationalisation, the research explains a construct's meaning in measurement terms by specifying the activities or operations necessary to measure it (Hair, Bush & Ortinau 2004; Sekaran 2010). The construct of entrepreneurial intentions cannot be directly observed or measured; researchers attempt to indirectly measure them through operationalisation of their components (indicators). In order to increase reliability, each construct was operationalised with multiple items and a questionnaire designed to test thefive research hypotheses on the dependent variable of entrepreneurial intention listed below in Table 1.1.

 Empirical support: Oyugi J. L., 2014; Sheta A., 2012; Roudaki 2009; Solomon 2007; Souitaris et al. 2007, Menzies & Tatroff, 2006; Veciana, Aponte & Urbano, 2005, Wang & Wong, 2004, Peterman & Kennedy 2003; Gibb 2002. H2: The approach of teaching methods and pedagogy has a direct positive effect on entrepreneurial intention among the Malaysian university students.
Oyugi J. L., 2014; Sheta A., 2012; Roudaki 2009; Solomon 2007; Souitaris et al. 2007, Menzies & Tatroff, 2006; Veciana, Aponte & Urbano, 2005, Wang & Wong, 2004, Peterman & Kennedy 2003; Gibb 2002. H2: The approach of teaching methods and pedagogy has a direct positive effect on entrepreneurial intention among the Malaysian university students.
Urbano, 2005, Wang & Wong, 2004, Peterman & Kennedy 2003; Gibb 2002. H2: The approach of teaching methods and pedagogy has a direct positive effect on entrepreneurial intention among the Malaysian university students.
H2: The approach of teaching methods and pedagogy has a direct positive effect on entrepreneurial intention among the Malaysian university students.
university students.
Empirical support:
Laguador J. M., 2013; Zahra et al., 2012; Fayolle 2008; Krueger 2007;Kuratko 2005; Bechard & Gregoire 2005b; Morse & Mitchell
2005; Edwards & Muir 2005; Saks & Gaglio 2004; Sogunro 2004
H3: The University's role in promoting entrepreneurship has a direct positive effect on entrepreneurial 2intention among the
Malaysian university students.
Empirical support:
Zhang et al., 2014; Linan et al., 2011, Yar Hamidi et al. 2008; Turker et al., 2008; Nurmi & Paasio 2007; Kuratko 2005; Rothaermel
& Thursby, 2005; Powers & McDougall 2005; Shane, 2004a.
H4: Attitude factors have a direct positive effect on entrepreneurial intention among the Malaysian university students.
Empirical support:
Schlaegel C. Koenig M., 2014; Kautonen Teemu et al., 2013; Schwarz et al. 2009; Franke & Luthje 2004; Lim & Teo 2003; Shane

I	et al. 2003; Krueger et al. 2000;
	H5: Stakeholder support system factors have a positive effect on entrepreneurial intention among Malaysian university students.
	Empirical support:
	O'Connor A, 2013;Laspita et al., 2012; Karlan D & Valdivia M. 2011; Matlay 2009; Romani et al. 2009; Fehr & Hishigsuren 2006;
	Reynolds et al. 2005; Stevenson & Lundstro m 2005; Tan & Peng 2003;

Table. 1.1 Hypotheses development

Design of the study measurement: The questionnaire was designed by the researcher and set out so that the respondents understand the information required for them to complete and return to the researcher. The researcher designed the self-administered questionnaire with the relevant questions according to the development of the hypothesis (Zikmund 2010). Self-administered questionnaires offer anonymity and avoid interview bias. Its effectiveness is seen with a high response rate for a target population that is well educated with a strong interest in the topic (Neuman 2006). The questions designed were simple, without much ambiguity, ensured anonymity, with the adherence of content, construct validity and reliability measures. To conduct the pilot study of pre-testing the questionnaire, a sample of 30 respondents were selected from two entrepreneurial-focused universities. The respondents were students from the disciplines of business and information technology studying in the final year. The seven sections in the questionnaire consisted of questions related to the independent variable of entrepreneurship educationand its components of entrepreneurship curricula, teaching methodologies and university's role in promoting entrepreneurship, mediating variables of attitude and stakeholder support system factors and the dependent variable of entrepreneurial intentions. The questionnaire was designed on a 7 point Likert scale (Burns & Bush 2000) with ten to twelve questions in each section. Reversal questions were used to test the awareness and concentration. In total the questionnaire consisted of 78 questions for the respondents to answer. The students were provided with an information consent sheet and written instructions on the first page briefly explaining the purpose of the study and ethical considerations were taken into account to maintain privacy and confidentiality of the respondents. They were also notified that it was an academic project pertaining to the effectiveness of entrepreneurship education on Malaysian University students and their entrepreneurial intentions after the program of study. The survey was conducted with the approval of the University authorities and the teaching staff concerned. When the students returned their questionnaires, they were assumed to have taken part in the study and their identities were treated with strict confidentiality and not revealed for any purposes. Fig.1.1 illustrates the hypothesised structural model developed for the study.



Fig. 1.1 Hypothesised CFA Model

IV. DATA ANALYSIS

Descriptive analysis was computed to analyse the respondents' demographic characteristics such as gender, age, race, origin of place, birth order, educational level, family history, working experience, interest in program of study, choice of study program, parents working status, interest in entrepreneurial career, motivation in

entrepreneurship and skills development. The demographic variable consisted of 5 items namely gender, ethnicity, family history, personal characteristics and program study. The pilot testing consisted 57% of female and 43% of male population and had an ethnicity composition of 70% of Malay respondents. Overall results proved that the respondents had some family history, either parents or relatives as entrepreneurs (70%); program study resulted in 83% of the respondents having their own choice in selecting the program; and 66.6% were motivated to become entrepreneurs and 57% were interested in self-employment. Reliability test was conducted using the cronbach alpha coefficient to test the overall reliability in the questionnaire for the pilot testing. Five of the variables (entrepreneurship curricula, teaching methodologies, university role, attitude factors and stakeholder support system factors) showed the measurement of cronbach alpha (α) more than 0.90 and indicated an excellent value. The dependent or latent variable of entrepreneurial intention had a cronbach alpha (α) of 0.85 indicated that reliability value is good (Hair et al. 2014). In the pilot test face validity was established as this made it available for the assessment and improvement of the questionnaire. The content validity of the questionnaire was measured with the review of the questionnaire on the literature review of previous studies. To measure the construct validity, factor analysis was used to measure the consistency between the questions and the theoretical constructs in the study. Lastly, Confirmatory Factor Analysis (CFA) was proposed to be used in this research as the researcher had some knowledge of the underlying latent variable structure (Byrne 2013).

Structural Equation Modelling (SEM) was used to measure the relationships among the latent and observed variables through the analysis of covariance among observable variables by forming the basis for estimating a structural relationship that describes the relationship of constructs stated in the questions. This process assisted the researcher to assess the contribution of each indicator variable in representing its associated construct and measured how well the combined set of indicator variables represented the construct in terms of reliability and validity.SEM is composed of two models, the measurement model and structural model. The measurement model consists of exogenous (independent variables) and endogenous (latent) variables. The model explains the fluctuations because all latent variables that influence them are included in the model specification. The specified model proposed by the researcher was based on the knowledge of the related theory and empirical research in the area of study that was tested on the sample data of the respondents. The model testing procedure determined the goodness of fit between the hypothesised model and the sample data. The difference between the hypothesised model and the observed data is termed the residual. The hypothesised model used AMOS 22.0 graphics program with path diagrams depicting a structural equation (SEM) model where the observed and unobserved variables were measured and errors were reflected in the measurement of the underlying factors. When the error items were eliminated, a re-specified model emerged and that became the final hypothesized model (Byrne 2013).

V. CONCLUSION

The paper discussed the structural equation modelling technique proposed to be used in the research paper. It justified the reason for using the structural equation modelling (SEM) approach. Structural equation modelling (SEM) technique was most appropriate in this study, as entrepreneurial intention is a latent variable. The methodology described the research paradigm and the research design chosen for the study. The methodology approach being purely quantitative suggested using a survey method. Steps were taken to design the questionnaire, administration of the questionnaire and assessment of the reliability and validity measures. Through the pilot test, reliability and validity was established in the questionnaire that was constructed in the research. A brief description was given justifying how the sample data was collected in the pilot study and how it was analysed using descriptive statistics and inferential statistics. Structural Equation Modelling (SEM) using AMOS 22.0was used to test the goodness fit of the hypothesised model.

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Theory

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