A MEASURE OF ADAPTIVE COGNITION OF ENTREPRENEURSHIP STUDENTS FOR SENSING THE ENVIRONMENT'S UNCERTAINTY, A STUDY IN AN AFRICAN UNIVERSITY

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ABSTRACT

Entrepreneurship is abundantly taught in the classrooms at universities worldwide to bridge the gap that has arisen between the number of graduates and employment opportunities available in the job market. Since the entrepreneurs' entrepreneurial mindset is different from others in the process of creating value and appropriation of rewards, the purpose of this study is to understand the readiness of the mindset of entrepreneurship students for sensing the uncertainty in the environment for venturing into entrepreneurship opportunities in the market. Hence, this metacognition research founded on a positivist approach quantitatively assesses the cognitive adaptability of a sample of 196 students at an African university.

The study's findings reflect that the metacognitive adaptability of the students had not been developed similar to the entrepreneurs. Hence, it is recommended *to redesign the pedagogies of entrepreneurial education so that the university's entrepreneurial students would be dynamic, flexible, and self-regulating to sense the uncertainty in the environment. However, the results are subject to the study's limitation that the self-administered questionnaire may inflate or deflate variables even though several ex-ante and ex-post approaches would be used to minimize common method bias.*

Keywords: Entrepreneurship, Entrepreneurial Mindset, Metacognition, Adaptive Cognition, Decision Making Process.

INTRODUCTION

The mission of a university is to integrate its graduates into professional life and society. In this regard, the conventional role is to prepare their students for being employed in the labor market. This role is becoming more challenging due to the increasing mismatch between the graduate job market and the rising graduate output. Hence, universities have now started to prepare their graduates for being self-employed (Lorenco et al., 2013) by offering courses in entrepreneurship and small business management that are more comprehensive than specialized (Kabongo & Okpara, 2010).

As a result, entrepreneurship researchers started investigating the traits of entrepreneurs as their stories of success. It appears now that the researchers have changed their direction from the traits of entrepreneurs to their mindset as their stories of success (Garcia et al., 2014). These researchers are labeled as cognitive researchers who investigate the people side of the entrepreneurs, such as memory, learning, problem identification, and decision-making abilities (Mitchell et al., 2002).

Under cognitive research, the cognitive adaptability of entrepreneurs is paid attention to by entrepreneurship researchers. Haynie and Sheppard (2009) define cognitive adaptability. They define it as "the ability to be dynamic, flexible, and self-regulating in one's cognitions given dynamic and uncertain task environments." Accordingly, cognition research on entrepreneurs' cognitive adaptability enables them to uncover how they sense the changes in the dynamic environment and change their behavior by adaptation required for such changes in the environment. This kind of behavior is somewhat proactive than reactive.

Students develop their metacognition while studying entrepreneurship education at their universities. Consequently, they enable sensing the uncertainties and exploiting opportunities in the environment. The students who were subject to this study learn two modules, Essentials of Entrepreneurship and Small Business Management. In these circumstances, a curiosity arises to ascertain if the entrepreneurial students have developed their critical entrepreneurial skills, adaptive cognition because the entrepreneurial mindset of the entrepreneurial students is different from others in creating value and appropriation of rewards.

Hence, this study aims to find the readiness of entrepreneurship students' mindset for sensing the uncertainty in the environment for venturing into the entrepreneurship opportunities in the market. Since the phenomenon is multidimensional and complex in this psychological research, a simple first-order construct cannot be tested. Therefore a higher-order model of structural equation modeling (SEM) is designed to measure the phenomenon. Hence, this research is carried out in search of dynamic, flexible, and self-regulating entrepreneurship students' skills for sensing the uncertainty in the environment. Such discoveries are significant to redesign the pedagogies of entrepreneurial education if required.

However, the findings are subject to the study's limitation that the entrepreneurial students subject to the study are not real entrepreneurs. Therefore, the self-administered questionnaire may have inflated or deflated variables even though several ex-ante and ex-post approaches had used to minimize common method bias.

METHODOLOGY

The research questionnaire with 36 items used in similar research by Haynie and Shepherd (2009) is adopted in this cognitive research. They had rewritten the instrument based on the 52 item inventory developed by Schraw and Deninson (1994) who developed the instrument to measure the adults' meta-cognitive awareness in an educational environment.

In this research, 36 Likert items were re-evaluated and decided to proceed with one alteration after the pilot run of the research instrument among a sample of 43 students. The 11 point scale of the original instrument was reduced to 5 point scale to improve the readability of 36 items scale. The five characteristics, Not very much Like me, Somewhat Not like me, Uncertain, Somewhat like me, Very much like me, have been aligned with the rating scale from 1 to 5 from left to right on the instrument. The purpose of the research and the participants' instructions were conspicuously printed. Among other things, the statement that the research is

anonymous and confidential that no one will know how they answer the questionnaire builds the confidentiality of data collection by ethical compliance.

The suitability of the data set for the factor analysis was first assessed with the sample size. In general, larger samples are better than small samples because larger samples enable producing stable solutions replicable, but larger samples are expensive and time-consuming. On the other hand, when the sample size is excessively large (> 400), then the method would be sensitive for any difference that would result in making the goodness-of-fit or poor fit (Tanaka, 1993). When the sample size is smaller, the correlation coefficients among the variables are not reliable because the correlation coefficient tends to vary from sample to sample giving invalid results. The rationality behind this is that factors obtained from a small sample may not generalize like a larger sample. Tabachnik and Fidell (2013) investigated this issue suggested that at least 300 cases are required for factor analysis but further pointed out that even a smaller sample of 150 cases is adequately provided that high loading marker variables are given. Another argument is that the number of cases required for the sample to be a ratio of participants to the observed variables. In this respect, Nunnally (1978) recommends a ratio of ten cases for each observed variable. Accordingly, a data set of 307 undergraduate samples in this study is adequate for generalization.

LITERATURE REVIEW

In general, cognition is referred to a mental process of a person in applying knowledge and experience acquiring through thoughts and senses for decision making among alternatives available to that person. Such a person's mental process referred to in this research is the cognition of an entrepreneur. It is defined as "knowledge structures [heuristics, schema] that people use to make assessments, judgments, or decisions involving opportunity evaluation, venture creation, or growth" (Mitchell et al., 2002b).

Metacognition is an extension of cognition. Haynie (2005) describes metacognition as knowing about knowing, in other words, aware of one's awareness. It is a higher-order thinking skill. Nelson (1996) describes metacognition as a heuristic process of developing new sense-making structures with the changing environment by self-regulation. In the same vein, Schraw & Denninson (1994) explain metacognition as a person's ability to be aware of his or her learning patterns and control. Accordingly, there are two components of metacognition, namely, knowledge about cognition and self-regulation of cognition. Hence, metacognition is higher-order thinking by being dynamic, flexible, and self-regulating to sense the uncertainty and adapt to changes in the environment (Haynie, 2005).

Cognitive research is an evolution of entrepreneurship research. Early entrepreneurship researchers investigated the entrepreneurial characteristics (Carland et al., 1988; Hornaday & Aboud, 1971; McGrath et al., 1992; cited in Haynie, 2009). Later, entrepreneurship research started focussing on various aspects of the entrepreneurial mindset. One of the concentrated areas of an entrepreneurial mindset is the cognitive adaptability process of entrepreneurs (Haynie and Shepherd, 2009 cited Mitchell et al., 2002b; Shepherd & Krueger, 2002). In these researches of the entrepreneurial mindset, there was an increasing acceptance of the notion that entrepreneurs' success relates to the dynamic, flexible, and self-regulating environment for sensing the uncertainty in the environment. However, there was a lacuna in the literature of quantified cognitive adaptability in particular. In filling the lacuna, Schraw and Dennison (1994) introduced the instrument worth paying attention to in this research. In their research, they developed an instrument to quantify the metacognitive awareness of entrepreneurial mindset in the context of

the educational environment. This instrument was later developed by Haynie and Shepherd (2009) removing specific educational context and making it to be the generic situation of entrepreneurs. Their instrument initially consists of 54 items, out of which 12 items were later removed to prevent producing an identity matrix. Otherwise, data would be less beneficial for factor analysis. The remaining 42 items satisfied Measure of Sample Adequacy (MSA), but 06 items were later removed because they did not load adequately any of the five factors. Therefore, the 36 item measure of cognitive adaptability tested empirically confirmed the theoretically justified priory five-factor model.

This instrument gave opportunities to assess the measure of adaptive cognition in a different entrepreneurial context. García et al. (2014) tested at a university in Spain. Urban (2012) tested the instrument in South Africa. In these circumstances, this research is carried out with the same instrument at a university in Botswana.

PRIORI FIVE-FACTOR MODEL

There is a priori knowledge about the cognitive adaptability of entrepreneurs. In other words, cognitive researchers have conceptualized cognitive adaptability as an aggregation of five theoretical factors. They are goal orientation, metacognitive knowledge, metacognitive experience, metacognitive control, and monitoring (García et al., 2014; Haynie & Scheperd, 2009; Urban, 2012).

Figure 01 describes the conceptual model which is tested in this study. According to the model, entrepreneurs' cognitive adaptability results from five interrelated processes that aggregate together for the metacognitive functioning of cognitive adaptability. The first process is goal orientation. It means, having perceived the environment's characteristics, entrepreneurs consciously set their own goals being interactive with the environment. Griffin and Ross (1991) argue that goal orientation is a result of two factors that relate to each other: the context and the motives of the person, both of which have a reciprocal effect on each other (Haynie et al., 2010).

The second and third processes, metacognitive knowledge and metacognitive experience, are simultaneous. Metacognitive knowledge means the conscious understanding of cognitive matters. These matters are internal and external. The matters relating to the person such as person's own preferences and values which are internal. The matters relating to the external environment, such as knowledge of other people, competitors, suppliers, customers, are external (Haynie & Schepherd, 2009).

The third process is the metacognitive experience that means the past experiences, intuitions, and memories used in the cognitive activity. These elements act as a hunch or gut of entrepreneurs when managing the environment (Haynie et al., 2010).

The fourth process is the metacognitive choice, which means evaluating outcomes by comprehension, understanding, and/or behavioral action in choosing the best alternative and its implementation. Haynie et al., (2010) argue that the entrepreneurs at this stage process their knowledge and experiences in choosing the best alternative which matches their goal orientation.

The fifth process is metacognitive monitoring, which means the post-implementation cognitive process under which the entrepreneurs identify the feedback of the decision-making's effectiveness concerning their goal orientation. After that, they carry out adaptation required by considering the entrepreneurs' environment's context (Haynie & Schepherd, 2009).

CONFIRMATORY FACTOR ANALYSIS

The theoretical priori five-factor model for adaptive cognition (Haynie and Shepard, 2009) is designed as a higher-order hypothetical model for testing. The reflective model describes how unobservable five factors describe their concepts by their observable variables. This part of the hypothetical model is called the measurement model that describes the relationships between the unobservable five factors and their observable variables by way of correlations, mean, and the error variances. The other part of the model is called the structural model that describes the relationships among the unobservable factors by way of correlations. These two parts together represent a structural equation.

The higher-order construct so designed is measured by the second generation multivariate analysis technique called Confirmatory Factor Analysis (CFA) of Structural Equation Modelling (SEM). The SEM, which consists of the measurement model and structural model, enables examining the relationships between the measured variables and the respective unobservable/latent factors explaining the relationship between the factors for cognitive adaptability. The CFA without the Exploratory Factor Analysis (EFA) is the most appropriate technique because the model is theoretically grounded and hypothesized the causal relationship described above based on the theory of cognitive adaptability. Hence, the researchers determined the five factors that determine cognitive adaptability but not the statistical technique like exploratory factor analysis.

The hypothetical five-factor model was tested by the data collected from the student sample to ascertain the model's fitness with the data. Amos Graphics was used for both modeling and testing. The testing process began with identifying the model as an over-identified model (DF >0). The degrees of freedom are positive, indicating that the number of distinct sample moments (702) is more than the number of parameters to be estimated (115).

In testing, the parameters of the population are estimated on Maximum Likelihood Estimation (MLE). Maximum Likelihood Estimation is the most commonly used estimation technique in Structural Equation Modelling (SEM) against previously used estimation technique called Ordinary Least Squares (OLS) regression. It is because MLE is more efficient and unbiased once the assumption of multivariate normality is satisfied (Hair et al., 2011 cited Wegener & Fabrigar, 2000).

Before testing multivariate normality, case screening was carried out to ascertain the missing data in rows, unengaged responses, and outliers. Regarding missing data, the SPSS data set was copied on an excel sheet and counted the number of blanks in each row, and found out that there were five cases with missing data, and their case numbers were identified. After tracing the case numbers, the missing data were corrected. Mahalanobis d-squared, which is the distance of each variable from the centroid, was considered regarding the outliers. Kline (2011) points out $p < .001$ as a more conservative value. Therefore, it was found 18 cases were deleted as outliers.

The multivariate normal distribution assumes that all the variables are drawn from a normally distributed population. SPSS-Amos provides two types of multivariate normality checks. One of them is providing univariate normality for each dependent variable using four columns, Skewness, their Critical Ratio, and Kurtosis Value, and their Critical Ratio. Adhering to the conventional alpha of .05, Critical ratio < -1.96 or > 1.96 is an indicator of departure from normality. Accordingly, almost all the manifest variables fall outside the Critical ratio < -1.96 or > 1.96 in this test, there is a violation of multivariate normality.

However, the violation of this assumption has little impact on this study because the sample size is large. The differences have arisen not by the outliers but by the skewness. It is evident by all values of Kurtosis values which are less than 2. Kline (2011) argues that it is easy to reject a null hypothesis when SEM uses a large sample. Therefore, he suggests not to reject when the Kurtosis value is <7 and skewness<3. Byrne (2010) explains that Kurtosis is more relevant than Skewness in SEM because Kurtosis has a more significant impact on the test of variances and covariances. Still, skewness has a greater impact on the mean.

Besides, two more tests, Kaiser-Meyer-Olkin Measure of Sampling Adequacy (MSA) and Bartlett's Test of Sphericity, were also carried out to ascertain the suitability of data structure for MLE. MSA quantified the degree of intercorrelations among the measured variables for evaluating the appropriateness of applying the factor analysis. A value below .50 is unacceptable. In other words, the value given by the test in this study .744 indicates that the data is highly suitable for the factor analysis. The other test, Bartlett's test of Sphericity value, is significant at .05 or smaller. Larger values indicate that the correlation matrix is an identity matrix. Namely, the null hypothesis states that the population correlation matrix items are not correlated and are failed to reject. Therefore the alternative hypothesis cannot be accepted (Nunnally & Bernstein, 1994). Since the value in this study is a smaller value (.000), the null hypothesis is rejected, and the alternative hypothesis is accepted. In other words, data is suitable for factor analysis.

Before assessing the model fit, loadings of seven items that have loadings less than .35 were deleted. After evaluating the suitability of the data set now, 289 cases, for factor analysis, parameters were calculated to ascertain evidence if the overall model fits the data set or not. Accordingly, several model fit indices were assessed. Among them, CMIN/DF, which is expected to be less than 3, is not satisfied by the estimated CMIN/DF was 7.287. CFI, which is expected to be above 0.95, is also not satisfied by the estimated CFI was .542.

Further, RMSEA, which is expected to be less than .05 to .10, is also not satisfied by the estimated RMSEA was .148. PCLOSE that is expected to be greater than .05 is also not satisfied by the estimated PCLOSE was .000. It means that the model does not fit with the data.

Hence, the model can be modified to ascertain if the model can be improved to fit with the data set. The model modification indices of Amos were used for the purpose. Accordingly, three modifications were carried out with error variances of the model using the highest values of covariances. Still, the improvements made by them were not sufficient to make the model fit with the data set because modifications were able to bring down CMIN/DF to 7.096, NFI .525, CFI .529, RMSEA .145, and PCLOSE .000.

INTERPRETATION OF FACTORS

The strong conceptual foundation of the model, the measure of adaptive cognition, previously tested is not merely adequate because the researchers of this research may make subjective judgments regarding the number of factors, the number of variables for each factor and their relationships etc. Hence, when interpreting a factor structure and the final factor solutions, several substantive measures such as factor rotation, factor loading, significance, and factor interpretation on the empirical bases can guide the interpretation.

Accordingly, factor rotation was used as a tool in interpreting the priori five-dimensional model. The five dimensions are goal orientation, metacognitive knowledge, metacognitive experience, metacognitive control, and monitoring. These priory five dimensions were

conceptualized to correlate among them and suggest the aggregation of them produce the adaptive cognition of entrepreneurs.

Even though the unrotated factor solution also provides information for factor reduction, the rotated factor solution provides more meaningful information. However, there are two techniques available for rotated factor rotations, the orthogonal factor rotation and oblique factor rotation. The fundamental difference between these two rotated factor solutions is that orthogonal factor rotation extracts factors by maintaining axes at 90 degrees. In contrast, oblique factor rotation extracts correlated factors rather than fixing the axes at 90 degrees. In general, the orthogonal factor rotation is the preferred method for data reduction to a smaller number of variables or data reduction to a set of uncorrelated variables for subsequent use in other multivariate techniques.

In contrast, the oblique rotation method is the best fit with theoretically meaningful factors because a few real-world constructs are uncorrelated (Hair et al., 2011). As a result, in this study, the oblique factor rotation is preferred over orthogonal factor rotation. Hence, Promax rotation was used in this study as an oblique rotated factor solution.

The significance of the factor loading was assessed adopting an approach similar to decide the statistical significance of correlation coefficients. Since the factor loadings have got significantly larger standard errors than typical correlation, the rules of thumb, the power level of .8, and significance level of .05 were followed, then the threshold of the factor loadings was determined .35 or above required for sample size 250 to 349 as per the table 3-2 of Hair et al. (2011). Therefore, the loadings below the outliers threshold were considered for elimination as not practically significant.

ANALYSIS

CFA as a restricted analysis used MLE and oblique rotated factor solution by Promax produces a five-factor solution based on eigenvalue greater than 1, which was confirmed by scree plot too. The solution explained 64% of the variance over the proposed five dimensions. Since larger discrepancies between the observed covariance and the predicted covariance indicate poor model fit, the observed covariance was compared with the predicted covariance for assessing the Goodness of Fit. The goodness of fit is significant at $p<100$. Therefore, the null hypothesis, the discrepancy between the observed and predicted covariance is equal to zero, cannot be rejected. No items practically insignificant were required to be eliminated because all loadings were greater than .35, resulting in a 36 item measure of cognitive adaptability. The factor loadings and eigenvalues are listed in Table 01. The table further displays the cross-loadings, namely, variables with two or more factor loadings exceeding the threshold value necessary for the factor interpretation process.

Structural Equation Modelling (SEM) was used to determine the significance level and the direction of the correlation between the factors and how five factors of the model are aggregated together. Findings that $p < .05$ and the positive correlation indicate these five factors produce cognitive adaptability. The five-factor model was collapsed into a one-factor model and compared with each other (shows in Table 2). Fit statistics, namely, the ratio of chi-square to degrees of freedom (x^2/df), Goodness-of-Fit Index (GFI), adjusted goodness-of-fit index (AFGI), Normed-Fit Index (NFI), Root Mean Squared Error of Approximation (RMSEA) were tested. Wheaton et al., (1977) point out that values less than 5 indicate good model fit based on the ratio of chi-square relative to degrees of freedom. Hatcher (1994) points out that the values

exceeding .90 are generally accepted to indicate a good model fit for the NFI and GFI. Hu and Bentler (1999) pointed out that an appropriate "cut-off" for the RMSEA is approximately .06.

RELIABILITY

The reliability assesses how variables, which are used to collect data, are consistent with the concept of the study. It is assessed unidimensional manner. Hence, "The reliability is a measure of the degree to which a set of indicators of a latent construct is internally consistent in their measurement. The indicators of highly reliable constructs are highly interrelated, indicating that they all seem to measure the same thing" (Hair et al., 2011). There are a series of diagnostic measures which can be used for assessing internal consistency. For example, composite validity, average variance extracted, and Cronbach's alpha. Nunnally (1978) points out that the generally agreed lower level of Cronbach's alpha is .7. In this research, Cronbach's alpha was calculated for each of the five dimensions of MAC. Accordingly, Goal orientation is .629. Metacognitive knowledge is .575. Metacognitive experience is .710. The metacognitive choice is .638, and Monitoring is .717. The Cronbach alpha value across all items is 0.924. Hence, it is concluded that all of these indicated an acceptable level of internal consistency. However, it is worth noting that since Cronbach's alpha was introduced in 1951, the most popular paper cited reliability test in more than 22000 studies is subject to criticisms. Cho & Kim (2014) discussed six misconceptions of Cronbach's alpha argue that unidimensionality and tau-equivalency should be calculated for SEM reliability. Still, Cronbach's alpha can be calculated if one of them is not satisfied shows in Table 1.

Table 1
RELIABILITY

Indicator variable name	Goal Orientation Loadings	Metacognitive Knowledge Loadings	Metacognitive Experience Loadings	Metacognitive Choice Loadings	Metacognitive Monitoring Loadings
GO01	0.54				
GO02	0.35				
GO03	0.70				
GO04	0.52				
GO05	0.56				
MK01		0.73			
MK02		0.33			
MK03		0.37			
MK04		0.24			
MK05		0.31			
MK06		0.52			
MK07		0.11			
MK08		0.32			
MK09		0.09			
MK10		0.67			
MK11		0.72			
ME01			0.29		
ME02			0.32		
ME03			0.88		
ME04			0.73		
ME05			0.64		
ME06			0.46		

ME07			0.56		
ME08			0.20		
MC01				0.32	
MC02				0.67	
MC03				0.61	
MC04				0.71	
MC05				0.37	
MO01					0.55
MO02					0.54
MO03					0.62
MO04					0.51
MO05					0.61
MO06					0.79
MO07					0.42
Cronbach's Alpha (.924)	0.629	0.757	0.710	0.638	0.717
	Factor 01	Factor 02	Factor 03	Factor 04	Factor 05
Eigenvalues	11.304	3.340	2.651	2.121	1.747
Percentage of variance	34.4	9.278	7.364	5.892	4.853
Cumulative Variance	34.4	40.678	48.043	53.935	58.788

VALIDITY

The validity assesses the extent to which the scale or the set of variables accurately represent the concept of study. In this regard, content/face validity, convergent validity, discriminant validity, and nomological validity are considered.

The face validity of this research refers to the extent to which the scale used enables measuring what the study has intended to test. This research administers a scale with 36 indicators used in previous research (Haynie & Schepherd, 2009; Urban; 2012; Garcia et al., 2014) and used in a pilot run to indicate the face validity of the scale. The scale at its face enables -measuring the cognitive adaptability of students as it intended.

Convergent validity refers to the degree to which two measures of the same concept are correlated. In other words, the indicators of a construct share a high proportion of variance in common. The convergence variance by high correlation indicates that the data comes from the same population. Another aspect is that the unexplained variance is low. Average Variance Extracted (AVE), which is required to be greater than 0.5, and Composite Reliability (CR) which is needed to be greater than Average Variance Extracted (AVE), were calculated (Table 01). The discriminant validity refers to the degree to which two conceptually similar constructs are distinct. In other words, a construct is, in fact, distinct from other constructs. In this regard, Maximum Shared Variance (MSV), which is required to be less than Average Variance Extracted (AVE) and the squared Inter Construct Correlations, which should be lower than the AVE, were also calculated (Shows in Table 2 & 3).

Table 1
VALIDITY

	CR	AVE	MSV	MaxR(H)
Monitoring	0.724	0.278	1.467	0.747
Goal Oriented	0.635	0.263	1.217	0.655
Knowledge	0.728	0.220	1.197	0.791
Experience	0.722	0.279	1.100	0.824
Choice	0.645	0.274	1.467	0.668

Table 2
VALIDITY

	Monitoring	GoalO	Knowledge	Experience	Choice
Monitoring	0.527				
Goal Oriented	0.964	0.513			
Knowledge	0.915	0.975	0.469		
Experience	0.968	0.955	1.049	0.528	
Choice	1.211	1.103	1.094	1.034	0.523

According to the calculations, the following validity concerns were dissatisfied. Reliability: the CR for GoalO is less than 0.70. Convergent validity: the AVE for Monitoring is less than 0.50. Convergent validity: the AVE for GoalO is less than 0.50. Discriminant Validity: the square root of the AVE for Monitoring is less than the absolute value of the correlations with another factor. Discriminant Validity: the square root of the AVE for GoalO is less than the absolute value of the correlations with another factor. Discriminant Validity: the square root of the AVE for Knowledge is less than the absolute value of the correlations with another factor. Discriminant Validity: the square root of the AVE for Experience is less than the absolute value of the correlations with another factor. Discriminant Validity: the square root of the AVE for Choice is less than the absolute value of the correlations with another factor. Discriminant Validity: the AVE for Monitoring is less than the MSV.

CONCLUSION AND RECOMMENDATION

This research aims to understand the readiness of the mindset of entrepreneurship students in sensing the uncertainty in the environment for exploiting the entrepreneurship opportunities in the market. In this respect, the theory of adaptive cognition of entrepreneurs was tested with the student sample. At a glance, entrepreneurs and students are not the same group of people in society. Therefore, there were some criticisms for researching students' entrepreneurial mindset similar to the mindset of entrepreneurs (Copeland et al., 1973; Robinson et al., 1991). In contrast, many researchers point out that cognitive researches are more appropriate for students. In this regard, it is argued that metacognition is developed from childhood to adulthood and student samples are more relevant because they have a greater heterogeneity than the entrepreneurs (Garcia et al., 2014; Haynie & Schepherd, 2009; Schraw & Deninson, 1994; Urban, 2012). These researches have immensely contributed to cognitive research from students' samples and commonly concurred with the theory of cognitive adaptability. The Structural Equation Modelling used in this study also is founded on their researches.

However, it was found that the model does not fit with the data when fitting the model with the data collected from the student sample. This indicated that the metacognitive adaptability of the students had not been developed similar to the entrepreneurs. Hence, it is concluded that this research failed to reject the null hypothesis that "the mindset of entrepreneurship students for cognitive adaptability is as same as with the entrepreneurs."

In these circumstances, it is recommended to develop the current curriculum and the relevant pedagogies to develop a mindset of the students for cognitive adaptability to sense the uncertainties in the environment for venturing into entrepreneurship opportunities. This recommendation is in line with the cognitive researches findings earlier discussed that metacognition can be developed from childhood to the early stage of adulthood (Schraw & Dennison, 1994)

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