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Entrepreneurial Leadership Questionnaire: Confirmatory Factor Analysis Evidence from School Context

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Abstract:- Objective: The main objective of the study is to ascertain the reliability of entrepreneurial leadership questionnaire (ELQ) among secondary schools in Zamfara State- Nigeria through teacher's perspectives.

Methodology: Structural equation modeling (SEM) AMOS using confirmatory factor analysis was adopted in this study. Total of 395 samples were chosen through multi stage random sampling technique as participants in the research. Data were collected through the administration of adopted instruments from previous researchers.

Findings: The Data was analyzed using Structural Equation Modeling (SEM) with AMOS graphics. Preliminary and subsequent assessments of model fits were conducted which fell within the acceptable threshold, and indicates the data fits the model x^2 (762) = 1249.211, p=0.00, x^2/DF=1.629, GFI=0.853; TLI=0.915, CFI=0.957; IFI=0.957, RMSEA= 0.042.

Conclusion: The findings indicated that the ELQ was highly valid and reliable to measure entrepreneurial leadership practice among secondary school teachers in Zamfara state, Nigeria.

Keywords: *Confirmatory Factor Analysis, Entrepreneurial Leadership, School, Teachers*

I. INTRODUCTION

Entrepreneurial behaviors are gradually gaining popularity in a variety of contexts. In organizations, these behaviors promote innovation and adaptation to the dynamic environments. Entrepreneurial leadership is a unique leadership practice that entails influencing the activities of an organization irrespective of its type, size and age with the aim of achieving the organizational goals (House et al., 1999). This leadership style assists leaders in guiding people towards the realization of the organizational vision and overcoming impediments that may pose a challenge to the organizational growth (Roomi & Harrison, 2011). Therefore, entrepreneurial leaders internalize and display their abilities to recognize new opportunities for the effective performance of their respective organizations (Bagheri, Lope Pihie, & Krauss, 2013). The central impact of entrepreneurial leadership behavior on improving leadership effectiveness and organizational performance is increasingly receiving attention by scholars in order to improve various aspects of organizational effectiveness (Xaba &Malindi, 2010; Berglund & Holmgren, 2006; Collins *et al*., 2004; Eyal, &Kark, 2004; Eyal&Inbar, 2003). According to Akinola (2013) entrepreneurial leadership has shown effective strength in the development of organizational effectiveness therefore, it is of paramount importance for organizations to enjoy the benefits of the innovative and proactive leadership practice.

The concept of entrepreneurship is an emerging concept in the arena of educational leadership. It is referred to as an innovative process of new vision, change and creation. It entails the display of some acts that are not traditionally common or being practiced in the course of managing an organization (Ezeani, 2012). Therefore, the role of the school leader in entrepreneurial leadership process of confidence building, being proactive and his ability to effectively communicate the vision of the school to all stakeholders will translate to an efficient and effective system (Ezeani, 2012). This justifies that, entrepreneurial characteristics and skills can be used in the process of improving school leadership by way of influencing the conduct of individuals operating in a school setting (Berglund & Holmgren, 2006). As a result, there is the need for school heads (principals) to not only acquire but at the same time put in to use the skills of entrepreneurial leadership for the attainment of school effectiveness as well as the enabling of school innovation practice (Hamzah, Yusof, & Abdullah, 2009).

Despite the fact that organizations are beginning to appreciate the role of entrepreneurial leadership towards the attainment of organizational goals, yet, there has been continuing debate on the reliable instrument

to measure entrepreneurial leadership behavior (Yusof, 2009). Furthermore, majority of the instruments focused mainly on limited aspects of educational leader's entrepreneurial leadership behavior (Yusof, 2009). In response, this study aimed at ascertaining the reliability of entrepreneurial leadership questionnaire through teacher's perspectives.

II. LITERATURE REVIEW

2.1 Concept of Entrepreneurial Leadership

Entrepreneurial leadership as a new concept in the field of leadership have witnessed diverse opinions as regards to its conceptualization (Roomi & Harrison, 2011). Some scholars have taken in to consideration the links between entrepreneurship and leadership and defined the concept as leadership style in multidimensional and stimulating environments (Renko, El Tarabishy, Carsrud, & Brännback, 2015). Entrepreneurial leadership involves the leadership's ability to influence and guide the performance of group members toward the achievement of organizational goals that involve identifying and utilizing opportunities (Renko et al., 2015). By integrating the views of other scholars on the meaning of the concept entrepreneurial leadership (Roomi & Harrison, 2011) defined the concept as the ability to communicate and involve groups to recognize, improve and take advantage of opportunity in order to gain competitive benefit. Practicing entrepreneurial practices by leaders and leadership values by entrepreneurs have one common goal of dealing with the tasks and dilemmas of existing organizational settings and eventually improving the effectiveness of the leaders (Cogliser & Brigham, 2004). Entrepreneurial leadership has been defined as leadership style distinctive from other types of leadership conducts essential in highly unsettled, inspiring and competitive organizations (House, Hanges, Javidan, Dorfman, & Gupta, 2004).The diverse nature of the literatures on entrepreneurial leadership is the possible reason for the challenges in defining of the concept itself. The perspectives are clustered into four main Categories that include; the link between the concepts of entrepreneurship and leadership, psychological approach, context of application and lastly overview of the construct without really defining it. However, despite the different approaches in defining the concept, it is clear that the role of entrepreneurial leadership behavior in improving leadership effectiveness and decision-making has gradually received great attention by scholars with a view to improving the effectiveness of organizations.

2.2 Models of Entrepreneurial Leadership

Entrepreneurial leadership is gradually receiving emphasis from researchers. Hence, there is an increase in researches aimed at discovering and models that explain entrepreneurial leadership (Cogliser & Brigham, 2004). Some of the models for entrepreneurial leadership are;

1. Enactment model of Entrepreneurial Leadership

Gupta, MacMillan, and Surie (2004) developed a framework of entrepreneurial leadership in organizational settings. The effectiveness and authenticity of the concept was explained using data originally collected from the GLOBE project (Global leadership and organizational behavior effectiveness). Taking in to cognizance the challenges faced by leaders in the process of institutionalizing entrepreneurial leadership in their organizations, the model postulates two major challenges faced by entrepreneurial leaders: "Scenario enactment" and "Cast enactment". Scenario enactment entails the challenges of entrepreneurial leaders in envisaging the prospect and establishing an atmosphere of inventive opportunities. In order to deal with this task, there is the need for leaders to be active and forecast forthcoming opportunities, take responsibility of the risks to endorse vision. Secondly, cast enactment, refers to the challenges encountered by entrepreneurial leaders in their efforts to convince and stimulate their subordinates to endorse and support the crusade for an innovative leadership practice. Gupta et al (2004) measured entrepreneurial leadership practice using a sample of 15,000 managers across 62 societies. The results showed effectiveness of entrepreneurial leadership concept, but the five roles were not discriminately valid. This calls for the need for further research on a suitable model to discuss and measure entrepreneurial leadership practice.

2. Competencies Model of Entrepreneurial Leadership

The quest for a model to explain entrepreneurial leadership practice based on two stages of organization establishment and development, Swiercz and Lydon (2002) conducted a study on managers who have acted as entrepreneurial leaders and effectively led entrepreneurial activities throughout the phases of entrepreneurial growth. The model centered on the outcomes they proposed a model of entrepreneurial leadership competency, based on the model, entrepreneurial leaders have two main competencies comprising self- and functional competencies. Self-competencies comprise of intellectual righteousness, stimulating the organization instead of the leader, employing outside advisors and producing a viable organization. Self-competencies are less physical and non-functional competencies within individual entrepreneurial leaders. Functional competencies are linked to the physical accomplishments of entrepreneurial leaders towards the effectiveness of their organizations. Despite the fact that the model identified several characteristics required of

leaders to grow through stages of organizational development, it is was founded on the basis of organizational growth and development in phases. Furthermore, the model is lacking explanations on how entrepreneurial leaders develop their skills over time. On the overall, the model concentrated much on the application of entrepreneurial leadership in profit making organizations neglecting organizations in other sectors.

3. Thornberry (2006) Model of Entrepreneurial Leadership

This model discussed entrepreneurial leadership by discussing its application at both individual and managerial levels, the model was developed through the integration three different leadership styles (transformational, transactional and charismatic), hence it is referred to as an integrated approach. The model discussed entrepreneurial leadership as a concept with five dimensions of: general entrepreneurial leader behavior (GELB), explorer behavior (EXPB), miner behavior (MINB), accelerator behavior (ACCB) and integrator behavior (INTB). The framework measured how entrepreneurial leaders apply their innovativeness, proactiveness and risk taking abilities to perform their tasks. According to the model, General entrepreneurial behavior is the leader's ability to display an entrepreneurial behavior and also provide an enabling atmosphere that supports innovative behaviors for the accomplishment of their jobs. Explorer behavior denotes the entrepreneurial leaders' action in recognizing new opportunities for the development of the organization, increasing creative policies for the organization's performance and improvement. Furthermore, miner behaviors are the leader's action in the execution of leadership tasks in a creative manner through the application of innovative approaches to solve organizational problems. Accelerator behavior is related to the leader's ability to use his skills to stimulate his subordinates' staff for innovative thinking, and creating a positive atmosphere for them to apply new approaches. Lastly, integrator behavior is the leader's ability to effectively communicate the organizational goals to the staff and empower them to participate in decision making process. A critical analysis of the above discussed models on entrepreneurial leadership have shown that, the Thornberry (2006) model has an edge over the other models due its ability to conceptualize entrepreneurial leadership practice at both personal and organizational levels. Furthermore, the model focused on creating and supporting environment by a leader for entrepreneurial activities to take place and at the same time inspire and encourage the subordinates towards the actualization of the organizations vision.

III. METHODOLOGY

3.1 Participants

The population of the study consisted of 4996 teachers serving in all the public secondary schools spread across 14 local governments of Zamfara State. Using the Cochran's (2007) formula of determining sample size, a total of 395 samples were chosen as participants in the research. The choice of the participants was made through a multistage random sampling due to the reason that all the teachers possess the same characteristics.

3.2 Instrumentation

Entrepreneurial leadership questionnaire (ELQ) by Thornberry (2006) was used to measure entrepreneurial leadership practice. It is a five Likert type scale consisting of 50 items measuring five dimensions of entrepreneurial leadership including general entrepreneurial leader behavior (GELB), explorer behavior (EXPB), miner behavior (MINB), accelerator behavior (ACCB) and integrator behavior (INTB). The instrument have Cronbach's alpha value of .963 and composite reliability of .896. Permission was obtained from the original author of the instrument before conducting the study.

IV. RESULTS

The data was analyzed using descriptive statistics in order to present the demographic features of the respondents and structural equation modeling (SEM) with AMOS 22.0 was used to determine the reliability of the entrepreneurial leadership questionnaire (ELQ).

4.1 Descriptive Findings

The sample population was predominantly male with 58% while the female respondents constituted 41.1%. Furthermore, In terms of educational qualification, 11.15% of the respondents were holders of master degrees, 57% were holders of Bachelor of education degrees and 31.6% were having Nigerian Certificate in Education.

4.2 Multivariate Normality and Assumptions

The range of values for univariate skewness and kurtosis, multicolinearity and outliers were checked, and the results have shown univariate normality. There was no evidence of multivariate violation.

4.3 Inferential Findings

Structural equation modeling (SEM) was used to ascertain the reliability of the instrument. Confirmatory factor analysis (CFA) which is a stage in SEM is applied to ascertain the model fitness, convergent validity and construct reliability. Model fit is assessed in order to assess the fit indices and individual factor loading of items and delete the items with a factor loading below 0.5. Equally, second order CFA to test the convergent validity and to test for the construct reliability of each construct. Therefore, Confirmatory factor analysis (CFA) was conducted to examine the construct validity as well as the model fitness.

4.4 Measurement Model

The measurement model for ELP was assessed using all ELP dimensions. The measurement CFA model of ELP comprises of 50 items to measure 5 dimensions. Out of the 50 items, nine were dropped from the model out of which 1 item EXB 4 was dropped in order to increase the model fitness while GEL 3, EXB 1, EXB 5, MNB 4, ACB 4, ACB 7, ITB 8 and ITB 14 were dropped as a result of low factor loadings. The results showed that measurement model fits the data well with x^2 (762) = 1249.211, p=0.00, x^2/DF=1.629, GFI=0.853; TLI=0.915, CFI=0.957; IFI=0.957, RMSEA= 0.042. The items factor loadings are presented in Table 1

Table 1: Items Factor Loading in Initial and Final Fitted Measurement Model for ELP

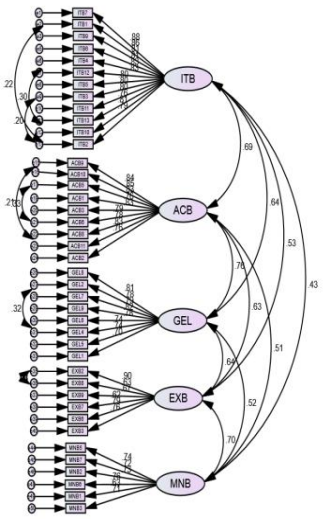
Construct	Item	Factor Loading		CR	AVE	MSV	ASV
		Initial	Modified				
General Entrepreneurial leader	GEL1	0.7	0.704	0.922	0.597	0.572	0.415
	GEL2	0.798	0.78				
	GEL3	0.421	Del				
	GEL4	0.763	0.74				
	GEL5	0.747	0.745				
	GEL6	0.776	0.784				
	GEL7	0.784	0.787				
	GEL8	0.804	0.81				
	GEL9	0.823	0.825				
Explorer Behavior	EXB1	0.333	Del	0.874	0.541	0.489	0.395
	EXB2	0.893	0.897				
	EXB3	0.779	0.761				
	EXB4	0.786	Del				
	EXB5	0.372	Del				
	EXB6	0.798	0.792				
	EXB7	0.603	0.615				
	EXB8	0.651	0.634				
	EXB9	0.655	0.673				
Miner Behavior	MNB1	0.626	0.626	0.863	0.513	0.489	0.303
	MNB2	0.728	0.731				
	MNB3	0.714	0.712				
	MNB4	0.452	Del				
	MNB5	0.74	0.743				
	MNB6	0.759	0.756				
	MNB7	0.724	0.721				
Accelerator Behavior	ACB1	0.759	0.763	0.945	0.655	0.572	0.426
	ACB2	0.748	0.762				
	ACB3	0.821	0.829				
	ACB4	0.348	Del				
	ACB5	0.841	0.827				
	ACB6	0.811	0.792				
	ACB7	0.359	Del				
	ACB8	0.794	0.782				
	ACB9	0.844	0.844				
	ACB10	0.856	0.848				
	ACB11	0.828	0.831				
Integrator Behavior	ITB1	0.865	0.861	0.960	0.665	0.472	0.338
	ITB2	0.803	0.788				
	ITB3	0.803	0.799				
	ITB4	0.821	0.826				
	ITB5	0.801	0.805				
	ITB6	0.803	0.807				
	ITB7	0.875	0.877				
	ITB8	0.423	Del				

	ITB9	0.809	0.812				
	ITB10	0.814	0.813				
	ITB11	0.801	0.803				
	ITB12	0.834	0.825				
	ITB13	0.772	0.761				
	ITB14	0.364	Del				

The second step in this measurement model was to evaluate the convergent validity, construct reliability and discriminant validity. The results showed that the value of AVE and CR were greater than 0.50 and 0.80 respectively; (General Entrepreneurial Leader AVE = 0.545 and CR = 0.922), (Explorer Behavior AVE = 0.541 and CR = 0.874), (Miner Behavior AVE = 0.513 and CR = 0.863), (Accelerator Behavior AVE= 0.655 and CR = 0.945) and (Integrator Behavior AVE = 0.665 and CR = 0.960). A minimum of 3 items, or preferably 4 items are required to represent suitable construct domain in illustrating a particular theory (Hair, Anderson, Babin, & Black, 2010). For this research, all the five dimensions of entrepreneurial leadership are represented by more than four items. Furthermore, a discriminant validity test was conducted to determine how the constructs are distinct from one another. For any two constructs, the discriminant validity is achieved if the correlation coefficient (r) is less than .90 (Hair et al, 2010) or when the individual AVE is greater than their corresponding r^2 (Byrne, 2013). For this research, the results in Table 2 have shown that the relationship between the constructs is less than .90. Hence, the assumption of discriminant validity is not violated.

Table 2: Correlation matrix among sub-constructs

	EXB	**ITB**	**ACB**	**GEL**	**MNB**
EXB	**0.735**				
ITB	0.534	**0.815**			
ACB	0.628	0.687	**0.809**		
GEL	0.643	0.637	0.756	**0.773**	
MNB	0.699	0.434	0.515	0.519	**0.716**



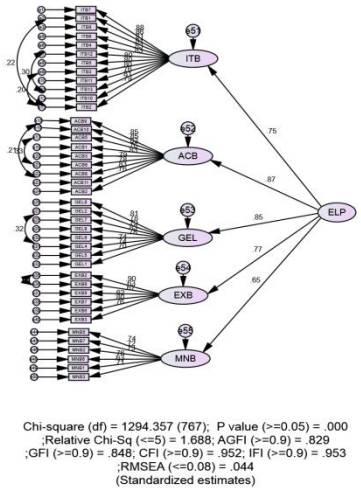
Chi-square (df) = 1241.299 (762); P value (>=0.05) = .000
;Relative Chi-Sq (<=5) = 1.629; AGFI (>=0.9) = .834
;GFI (>=0.9) = .853; CFI (>=0.9) = .957; IFI (>=0.9) = .957
;RMSEA (<=0.08) = .042
(Standardized estimates)

Measurement Model for Entrepreneurial Leadership Practice

Second Order CFA

A second-order confirmatory factor analysis was conducted In order to establish an evidence for the use of the dimensions in the final model of ELP. The results obtained indicated that the model fit the data well:

$x^2(767)$ = 1294.357, x^2/DF= 1.688, p=0.000, GFI=0.848; AGFI=0.829; CFI=0.952; IFI=0.953, RMSEA= 0.044. The results indicated that goodness-of-fit indices such as GFI, AGFI, CFI, and IFI significantly pass the threshold value. In addition, RMSEA was 0.044. The model is presented in Figure 2;



Second Order CFA for Entrepreneurial Leadership

V. DISCUSSION AND CONCLUSION

The Confirmatory Factor Analysis (CFA) is the first step in preparing Structural Equation Modeling (SEM) data. CFA was used to test the individual construct of entrepreneurial leadership items. The purpose is to test for model fit, convergent validity, and construct reliability. Model fit test found that factor loading was greater than 0.50 and achieved some fit indices (Relative Chi-Square, fit index and RMSEA). Convergent validity was achieved when AVE was greater than 0.50 and construct reliability was greater than 0.70. Furthermore, CFA was carried out using measurement model through discriminant validity analysis. Our findings indicated that the ELQ was highly valid and reliable to measure entrepreneurial leadership practice among secondary school teachers in Zamfara state, Nigeria.

Furthermore, The findings of this study established the fact that entrepreneurial leadership is a multi-dimensional construct that can be measured using five dimensions that include; general entrepreneurial behavior (GELB), explorer behavior (EXPB), miner behavior (MINB), accelerator behavior (ACCB) and integrator behavior (INTB) (Thornberry, 2006). The findings of this research have supported the findings of Pihie et al (2014) who found that ELQ is valid and reliable in measuring entrepreneurial leadership. However, the findings of this research have found that 3 items under the dimension of Explorer Behavior that include; my school principal Spends time on new strategies for school development, my school principal Passionately looks for new ways to develop the school and my school principal Motivates us to think of innovative ways to succeed in competitions were all dropped from the model as they appeared to be not relevant in measuring the construct in this study context. Similarly, 1 item under the Miner behavior; my school principal challenges us to creatively discover ways to do more with less was also deleted due to its low factor loading. Under the Accelerator behavior, 2 items; My school principal pushes us to innovate on how we do our work and my school principal encourages others to take the initiative and actions for their new ideas were also found to be not contributing to the construct and they were deleted. As regards to the dimension of Integrator behavior, 1 item; My school principal encourages open communication and sharing ideas across school units and functions was also deleted as it was found to have a low factor loading. Overall, the CFA showed a model with 42 (of the original 50) items provided satisfactory evidence to support the validity and reliability of the ELQ scale. This is consistent with the finding evident from the study of Pihie et al (2014), where the fitness of the model was proven in the context of Malaysian schools, although only 19 items were found to be contributing to ELQ whereas this study found 42 items, this difference could be possibly attributed to the study context and probably the samples respondents since their respondents are school principals, while the respondent of the present study were teachers. Hence, the perception of the respondents might differ as a result of their cultural difference. Moreover Gupta et al (2004) result suggested that measurement of entrepreneurial leadership practice might differ in some cultural setting.

The current study has some limitations. Firstly, the original instrument ELQ was developed to measure entrepreneurial leadership in business sectors while the current study utilized the instrument to measure entrepreneurial leadership practice in the school context. Thus, there may be some measurement variance between the participants from the two different contexts who may have interpreted the scale's items and latent constructs differently. Secondly, the samples of this study were only within Zamfara State. Therefore, the findings cannot be generalized to Nigeria. Thirdly, entrepreneurial leadership behavior of school principals was measured through teachers' perceptions. Further research should assess entrepreneurial leadership behavior through the perspective of school principals and parents. Lastly, there is a need for a qualitative study that examines how well this measure assesses all relevant facets of entrepreneurial leadership among school principals.

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