A Mediator Leadership Practices for Organisational Development Through Data Screening

Amer Ahmad AlAnazi, Azman Hashim, Amran Rasli

Abstract: This paper explored the data collected regarding the study on mediating effect of organizational innovation in the relationship between leadership practices and organisational performance. Seventy universities operating in Saudi Arabia participated in the study. The survey was completed by 248 principal officers on behalf of their respective universities. The results were then analysed using version 22 of the software package of the Statistical Package for the Social Sciences (SPSS). An initial data testing and preliminary review were conducted to ensure that the multivariate analysis assumptions were not broken. The analysis was carried out in this study explicitly with the missing values, outliers, regular test and multi-linearity testing. We concluded that the data were sufficient for further study.

Keywords:data screening, organizational innovation, leadership practices, organisational performance

I. INTRODUCTION

The value of initial data verification can not be overemphasized in multivariate data analysis techniques, as the validity of the inferences derived from the reliability of numerical test results depends largely on whether the core premises of multivariate analyses are violated. Although the validity of the inferences from statistical test results is based on the manner in which the data meets the key hypotheses of multivariate analysis, literature shows that many studies were done without breaching these hypotheses or not (Hoekstra, Kiers and Johnson, 2012).

The purpose of this paper was to examine the data collected in relation to the research on the media impact of corporate innovation on the connection between management and corporate results. Figure 1 shows the leadership development process of organization.
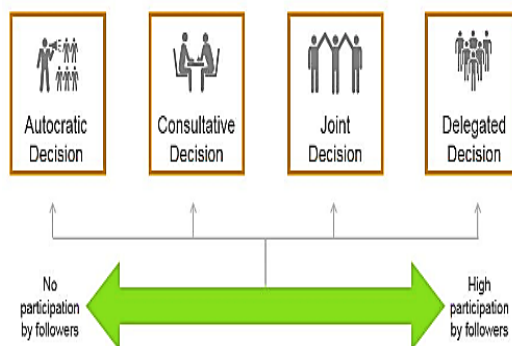

Figure 1. Leadership Development Process

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In general, we wanted to confirm that before the main analyzes for the research, the core assumptions of the multivariate analysis were violated. The remainder of the journal is structured in the following direction. The analysis approach used in this study was explained in section 2.

Section 3 tests are summed up and interpreted using the missing interest analysis, the outline assessment, the normality test and the multilinearity test. The results of section 3 are assessed. In short, Section 4 concluded on the basis of the results.

II. LITERATURE SURVEY

The reliability of an appropriate analysis depends on the quality of the initial data processing and handling. In this paper they also examine the determinants of Telecenter's product acceptance within Nigeria. Applicants issued one hundred and ninety one authentic questionnaires. In order to meet the need for multivariate analysis, the data testing and cleaning were done. Consequently, the analysis was carried out of the missing data, outliers, multi-linearity and normality. In addition, the principal element analysis (PCA) was used to conduct exploratory factor analysis (EFA).

The process to screen, edit and prepare initial data before any Multivariate Analysis (MA) on the impact of management styles, social capital and social entrepreneurship on Malaysia's organizational performance.Data testing is important to detect any potential violations of the fundamental assumptions related to the use of multivariate techniques.In fact, the initial data analysis helps the investigator to understand the data collected in greater depth.

III. METHODS

Sample and procedure

The research analysis was carried out in universities in Saudi Arabia. Based on the sample size of 248, 300 questionnaires had been distributed to senior officials from all universities operating in Saudi Arabia in this report. In order to reach a higher response rate in this study, several efforts were made, including telephone call reminders, SMS, for respondents who have not yet finished their survey one month after they received it (Dillman, 2000; Sekaran & Bougie, 2010). Therefore, 245 of the 300 questionnaires distributed to target respondents were sent to the survey.. In order to achieve a higher response rate in the present survey, multiple attempts were undertaken to complete the inquiry after a month from the date it was sent (Dillman, 2000; Sekaran & Bougie, 2010), including a telephone call alert and a short message service (SMS). While 245 of the 300 questionnaires provided to target participants were returned by these efforts. This resulted in an 82 percent response rate.

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The respondents failed to complete 32 of the 302 questionnaires that were incomplete and deemed useless because the remaining 213 questionnaires were used for evaluationThis accounted for 71% valid response rate. This represented a fair response rate of 71 per cent. Therefore, the true 71% rate based on Al-Marri, Ahmed and Zairi (2007) met all statistical criteria and was highly helpful for evaluating hypothesized relationships.

Measures

Change-oriented leadership

To measure change-oriented leadership Yukl's (2002) 13-itemchange-oriented leadership scale was adapted in this study. Examples of items are: "As the organizational leader, I encourage and facilitates innovation by others in my university". "As a leader, I develop innovative new strategies linked to core competencies in our university". "I empower people to implements new strategies in our university". Furthermore, self-ratings will be applied to each item on the change-oriented leadership scale using seven-point Likert scale ranged from 1 (*strongly disagree*) to 7 (*strongly agree*). The internal consistency coefficient of change-oriented leadership scale is above 0.70 of from several empirical studies (e.g., Alimo-Metcalfe & Alban-Metcalfe, 2001; Fernandez *et al.*, 2010; Gil, Rico, Alcover & Barrasa, 2005) using the original instrument items thus suggesting good reliability.

Marketing Orientation

In the proposed study, the ten-item Marketing Orientation Scale developed by Deshpandé and Farley (1998) with Cronbach's alpha of 0.88 shall be adapted to measure marketing orientation. Respondents rated their perception of marketing orientation using seven-point scale ranged from 1 (*strongly disapprove*) to 7 (*strongly approve*). For example, ' the purpose and the goals of our university are mainly driven by the student satisfaction ',we constantly monitor at our university our level of commitment and orientation to meet student needs ' and ' ' we openly communicate information on our successful and unsuccessful studies in all departments. (e.g., Aron & Liem Viet, 2007; Ospina & Perez, 2013; Šályová, Táborecká-Petrovičová, Nedelová & Ďaďo, 2015).

Organizational innovation

To measure organizational innovation,sixitemswere adapted from (Dibrell, Craig & Neubaum, 2014). Examples of items are: "our university engages in introducing specialized academic programmes", "this university develops new teaching and learning process" and "our university upgrades existing teaching and research facilities." Self-ratings will be applied to each item on the Organizational Innovation Scale using seven-point Likert scale ranged from 1 (strongly disagree) to 7 (strongly agree). The internal consistency coefficient of change-oriented leadership scale was 0.76, suggesting good reliability. As an evidence of well-established measure, organizational innovation scale has been successfully used in several empirical studies (e.g., Alimo-Metcalfe & Alban-Metcalfe, 2001; Fernandez et al., 2010; Gil et al., 2005). Figure 2 shows the Measure of Data Screening and Preliminary Analysis of organizational performance and marketing Orientation.
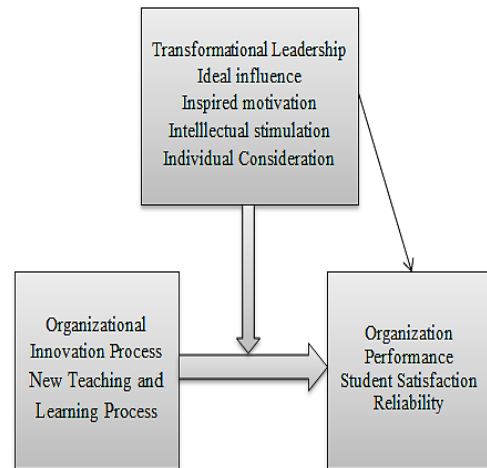

Figure 2.Measure of Data Screening and Preliminary Analysis

Organizational Performance

In the present study, ten items were adapted from the Organizational Performance Scale developed by (Niculescu, Xu, Hampton & Peterson, 2013)to measure organizational performance. The Cronbach's alpha for Organizational Performance scale was 0.81. This scale will assess all its items using a seven-point scale ranged from 1 (*very poor*) to 7 (*very good*). Examples of adapted items are: "the overall performance of this university in the last three years has been outstanding", "the performance of my university in creating student satisfaction in the past three years has been fairly good." and "the level of student services provided by my university in the last three years has been reasonable". A part from the present study, past researchers such as Chaudhry, Mahesar, Ansari and Ali (2016) and Józsa (2017) have utilized this scale and found it reliable.

IV. RESULTS AND DISCUSSION

Preliminary analyzes of statistical outliers, normality, linearity, homoscedasticity and multi-linearity before key analyzes are carried out. It meant that the statistical assumptions needed for multivariate analysis are met. The following is the results of each of the four key assumptions.

Statistical outliers

According to Fidell and Tabachnick (2007), the statistical outlier is "one event of extreme value in a variable (univariate outliner) or an odious combination of scores in 2 or more of the variables (multivariate outliner). Two types of statistical outliers have been studied, namely single and multivariate outliers. The first was developed according to universal standards. Tabachnic and Fidell (2007) note that a standardized case value of $\pm 3,29$ (p $<$, 001) or higher is considered to be univariate outliers. No standard values of $\pm 3.29 (p<.001)$ or more were found in all situations according to this criterion. No potential univariate outliers were therefore found. However, the multivariate outliers were tested on the Mahalanobis distance (D2) to ensure that statistic outliers in the present study were not violated. According to Tabachnick and

Fidell (2007), the distance Mahalanobis (D2) which refers to "the distance from the center of the remaining cases when the centroids are located. The research results of multivariate outliers are presented in Table 1.

Table 1. Multivariate Outliers Detected and Deleted

Respondents' Number	Mahalanobis Distance (D^2)
6	72.03838
25	81.26815
37	74.15971
49	78.82461
56	74.35705
65	71.59183
103	73.36757
141	79.61114
153	85.89186
162	76.57004
177	76.9801
178	79.96979
180	73.87117

Note. N = 39; df = 38; X^2 = 70.71; p = .001; $D^2 = \geq X^2$

The multivariate outliers analysis focused on 39 variables observed with a suggested chi-square limit of 70.71 (p= 0.001), as shown in Table 1. The data case with a desistance value higher than the chi-square is regarded as having a multivariate outlier, Skin, Brown, Babin and Anderson (2001). 14 multivariate outliers following Hair et al. (2010) have been reported and subsequently removed from the dataset (Table 1). Therefore, the final dataset used for the key analyzes was 213 after the deletion of 13 multivariate outliers.

Normality

Although PLS-SEM does not rely on restrictive assumptions of a standard multivariate distribution, such as structural ecuation covariance-based modeling (Hair et al. 2010; Hair, Ringle, & Sarstedt 2011), controlling the data behavior before carrying out important analyses is extremely important. This is to cause standard bootstrap errors and thus underestimate template structural relations by carrying out PLS-SEM analyzes on non-normal data (Chernick, 2008, Hair, Hult, Ringle, & Sarstedt, 2014).In this analysis both histogram and normal probability track (P-P plots) are considered for a comparison of the normal distribution curve data obtained (see Figure 1 for Annex B of the SPSS-output).
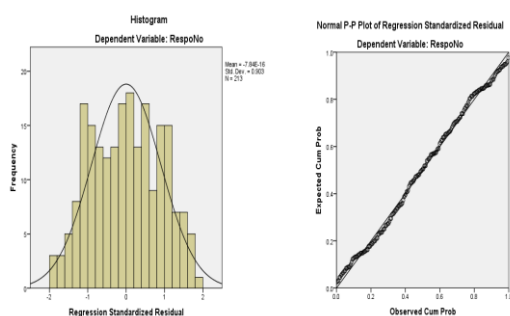

Figure 3.Residual / Normal Probability Plot (P-P Plots), Regression Histogram Standardized Residuals

The data gathered in the normal distribution curve are shown in figure 2. It is therefore possible to conclude that there was no violation of the principle of multivariate normal distribution.

Homoscedasticity

A situation where variances on the criterion variable tend to be constant over a variety of predictor variables (Hair etal, 2010) is known as homoscedasticity (e.g. equality of variations). It is also important to verify that homoscedasticity is met prior to carrying out the principal analysis, since heteroscedasticity is a major concern when the variation in a parameter varies from a number of independent variables. Heteroscedasticity can therefore significantly distort research results, increasing the likelihood of making a mistake in Type 1 (Hair et al., 2010).Similar to linearity, an analysis of the residual complot and that dispersed about zero points tested and homoscedasticity assumptions. As seen in Figure 3, homoscedasticity was not violated, as the remaining pieces scattered all around zero.
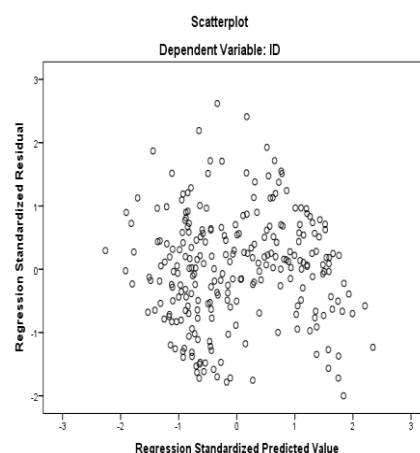

Figure 4.*Scatterplot of the Residuals*

Table 3 Results of Multicollinearity Test

Variables	Collinearity Statistics		Condition Index
	Tolerance	VIF	
Change-orientated leadership	0.36	2.75	11.35
Market Orientation	0.40	2.51	13.03
Organizational innovation	0.58	1.71	18.44

Multicollinearity

Check the value of the inflation factor (VIF) sensitivity and variance to verify whether the multicolinearity hypothesis was fulfilled. The sensitivity value is statistically defined as 1 minus the variance ratio (R2 value) which is clarified when the independent variable regresses with regard to all other independent variables. (Allison, 1999). VIF also applies to the sensitivity (1/1-R2) reciprocating and shows the degree of inflation by the presence of the correlation between the predictor models (Allison 1999; Jani 2014) for the calculated regression coefficients. Tolerance levels above have been calculated according to Hair et al. (2010). No crosslinearity of

independent variables can be shown between 10 and VIF values less than 10. The findings of a multicollinearity analysis between independent variables are summarized in Table 3. Table 4.5 indicates that the sensitivity values were between.296 and.865 and VIFs were between 1.156 and 3.374. However, the status indexes were both below the mark of 30. Therefore, multi-coloredness in this analysis is not a major problem.

Performance Ratio

This scale will assess all its items using a seven-point scale ranged from 1 (*very poor*) to 7 (*very good*). Examples of adapted items are: "the overall performance of this university in the last three years has been outstanding", "the performance of my university in creating student satisfaction in the past three years has been fairly good." and "the level of student services provided by my university in the last three years has been reasonable". The proposed SPSS have higher performance when compared to other existing methods. Figure 5 shows the performance ratio of SPSS method.
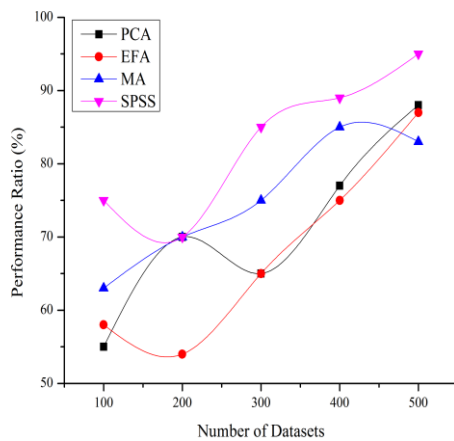

Figure 5. Performance Ratio

Precision Rate

In order to achieve a higher precision rate in the present survey, multiple attempts were undertaken to complete the inquiry after a month from the date it was sent, including a telephone call alert and a short message service (SMS).The proposed SPSS have higher precision when compared to other existing methods. Figure 5 shows the precision rate of SPSS method.
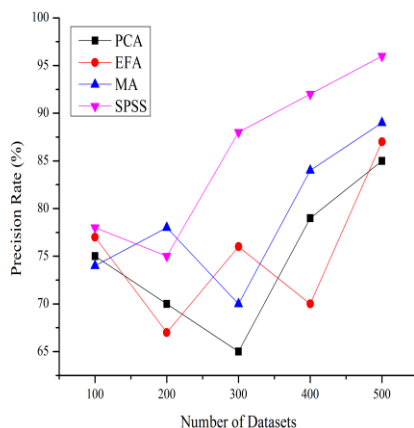

Figure 6. Precision rate

V. CONCLUSION

While initial and preliminary data contributed to multivariate credibility, most of the studies in the management sector have not demonstrated a breach of or not of the principal premises of multivariate analysis. We found that data collected in this research did not infringe on multivariate standards such as the assessment of surgeons, standard tests and non linearity tests after data analysis and preliminary analyses. We have therefore agreed that data for further multivariate analysis is sufficient and valid.

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