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The Exploratory Factor Analysis and Analysis of Reliability for Role Stressor, Leadership Style, Workplace Bullying and Job Performance Criteria

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Abstract

The Research Instrument is a method used to measure the observed natural and social phenomena. The data collection instrument in this research was survey questionnaire, which included statements intended to quantify key research constructs. Additionally, Validity is the proof from which an instrument tests what it is supposed to measure. In a research study, a valid instrument is necessary for gathering important and accurate data. This study was being performed as a valid and reliable instrument in Jordan. To assess the instrument, reliability test and exploratory factor analysis (EFA) were used to produce an empirical check of the questionnaire's validity and reliability. All items were measured using the ten-point interval scale using 1 for strongly disagree and 10 as strongly agree with the given statement. The instrument measured four constructs, namely Job Performance (JB), Role Stressor (RS); Role Ambiguity (RA), Role conflict (RC), Role overload (RO), Leadership Style (LS) Autocratic Leadership Style (ALS), Democratic Leadership Style (DLS), Laissez fair Leadership Style (LLS), and Workplace Bullying (WPB). The target population of this study is 15073 Administrative staff in Jordanian public universities based on the Annual Statistical Report on the Ministry of Higher Education in Jordan 2017. The sample size of this study is the 100 administrative staff in Jordanian universities. The Bartlett's Test of Sphericity is significant (sig. 000). Furthermore, the resulting values of KMO ranged from 0.820 to 0.926, which were above the cut-off value of 0.6. The four components have Cronbach's alpha values with more than 0.7. Furthermore, Cronbach's Alpha value for all 53 items also exceeded the threshold value of 0.7. The development scale and validation confirmed that the instrument is consistent and stable across samples.

Keywords: Exploratory Factor Analysis (EFA), Job Performance, Leadership Style, Reliability, Role Stressor, Validity, Workplace Bullying

Introduction

The ever-increasing role of organizations in the 21st century and their relentless pursuit to keep pace with development and growth, it increased its responsibilities and concerns and added goals that were not previously a priority. Transformations of the world, such as globalization, modernity, technological developments, information revolution

communications, and the internet, have created significant challenges for universities in order to improve employees and overall performance and reduce the hindrances which faced achievement and development to keep up with the contemporary what is new. Universities are required to implement open administrative policies and commit to accountability transparency, participation in decision-making, and decentralization, which finally help to achieve goals. Job performance (JP) has been and continues to be of interest to professionals at both levels theoretical, as scientists, writers, academics, and practical like businesspeople, managers, and decision-makers. JP is seen as a vital variable in human resource management (HRM), and organizational behavior (OB) thus can be reflected in the primary importance of active organizations (Roth, Purvis and Bobko, 2012). While JP is the total result of employees' work, the quality involved, time duration, and the effort to perform that work, although JP is well known to all organizations and managers as indicators of employees' adherence to it in the workplace (Brown & Leigh, 1996). Effectiveness of organizations influenced by the scope of employees' effective and JP (Brown & Leigh, 1996; Ramzy, El Bedawy, & Maher, 2018). Active and efficient individual employee performance gives high importance, which affects the productivity of overall performance (Pushpakumari, 2008). Job performance can differentiate between person-related and situation-related variables. Person-related is an individual difference that differs between individuals; Situation-related describes the work situation or the organizational setting (Sonnentag, Volmer, & Sychala, 2008; Zahargier and Balasundaram, 2011). Job performance has three dimensions: task performance, followed by counterproductive work behaviors (CWBs), then organizational citizenship behavior (OCBs). Performance will be known as employee behavior in the workplace related to organizational outcomes, Sackett (2002). At this stage, task performance represents behaviors that denote to the completion of tasks directly related to the performance of work tasks, while OCBs (positive side) behavior that contributes to representing additional functional behaviors aim at the role that the individual or organization benefits such as voluntary help colleagues. CWBs are (negative side) workplace behaviors that intended to harm individuals or organizations such as hurt colleagues or come late (Dalal, 2005; Dalal, 2009; Devonish, 2013). Role Stressors, according to Cohen (1980), undermine job performance at the same time, will give more significant cognitive resources to looking for role clarification, and harmonize conflicting difficulties. Since cognitive resources are inadequate, resources allocated to illustrative duties and reconciling challenges cannot consecrate to attaining performance (Cohen, 1980). Al-Khasawneh & Futa (2013) three types of leadership styles (LS) used by faculty members in Jordanian public universities and UKM universities namely (autocratic leadership style, democratic leadership style, with laissez-faire leadership styles) which reflected most pragmatic leadership style (Puni, Agyemang, & Asamoah, 2016; AbRahman, Awang et al., 2018; Fiaz, Su, & Saqib, 2017 Goren, 2018). For this study, the researcher will adopt this style of leadership. Leadership style adopted by the leader of the organization and job performance (JP) of employees affects the interrelationship between these concepts of organizational survival (Masa'deh, Obeidat & Tarhini, 2016). Leadership style represents one of the critical factors related to the achievement and failure of any organization. Leadership style is how employees are directed and encouraged by their leader to achieve organizational goals (Al Khajeh, 2018). Leaders play a vital role in organizational performance, employee satisfaction, and work enhancements (Bhargavi & Yaseen, 2016). Low performance associated with (WPB), poor psychological and physical health (Nielsen and Einarsen, 2012).

Bullying is harmful behaviors that have primarily been known by people who recognize themselves as victims of this behavior. The person who bullies the others uses different forms that express his or her power, such as verbal insult, facial expression, spreading rumours bullying is symptomatic undesirable actions can be executed by physical interaction, by words, outcast, and others (Olweus, 1994). Bullying will not succeed without gaining supremacy over others (Horton, 2011; Rodkin, Espelage, & Hanish, 2015). Workplace bullying (WPB) is a universal problem that has a critical influence on many workers. It is an alarming phenomenon that threatened employees as well as employers (Abbas & Selim, 2011). WPB is a well-known term for most forms of workplace aggression and violence. The WPB includes emotional abuse, physical violence, verbal abuse, and the threat of violence. The consequences of WPB has a significant impact on the victims such as bad behaviors, nervousness, sleep disturbance, feelings of trauma, weakness, powerlessness, silence, annoyance, clinical depression, and posttraumatic stress disorder, (Einarsen, 2000; Einarsen et al., 2010). According to (Leymann 1996; Einarsen 2000; Salin and Hoel 2003; Hoel et al., 2010; Agervold & Mikkelsen, 2004) organizational cultures, changes, structures, environment, reward, complicated procedure and leadership style considered the effect of WPB. Indeed, it is reasonable that a worker who exposed to WPB will tend to produce more destructive assessments of the psychosocial work climate (Nielsen, 2013). Though there are theoretical causes for predicting that a weak leadership may have a direct influence on WPB, it supposed that this influence transmitted through work-related elements where leadership's quality exerts a significant impact (Nielsen, 2013). WPB is an issue, but few empirical studies are existed to find the degree of bullying in the academic world (Giorgi, 2012). Bullying is predominant in various places of work, but the university's campus can be vulnerable to bullying behavior because of some specific academic characteristics. The difference in WPB affairs is a severe factor, while turnover and job satisfaction correlated with WPB (Ertureten, Cemalcilar & Aycan, 2013). The role stressors (RS) comprise (role conflict, role ambiguity, and role overload), which have an effect on performance and orientation (Knight, Kim & Crutsinger, 2007). To have an optimistic social-psychological place of work, Leaders have to improve and execute policies, techniques, and rules to boost the welfare and safety of employees (Karam, 2011; Geller, 2015). Preventing of WPB has to fit with the workplace's culture prevention. Therefore, leaders and staffs have to work together to improve their relationships (Swearer et al., 2014). Branine & Pollard's (2010) discuss that if an employee has a good relationship with leaders, his or her job performance is irrelevant. Universities are significant components nowadays communities, engines for social change, the growth of prosperity, and have an essential role in knowledge transmission, development, patronize behavior, and spread insightful cultures. Universities, as a social institution, affect and are affected by the social climate where they exist. Politicians, technical professional made in Universities from this perception every university should have its mission and vision used to achieve.

Methodology

The study used a quantitative approach research with a descriptive research design. In addition, the population of this study is 15073 Administrative staff in Jordanian public universities based on the Annual Statistical Report on the Ministry of Higher Education in Jordan 2017. The sample size of this study is the 377 administrative staff in Jordanian universities (Krejcie and Morgan, 1970). Hence, the sample was increased to 450 to avoid response bias (Hair et al., 2014). This study chooses ten public universities in three main

provenances in Jordan (north, middle, and south). The techniques used for the sampling analysis were proportional, and simple random sampling. Neuman (2014) proposed that a researcher build a detailed section framework to carry out a simple random sample, select functions from the frame employing a mathematical selection method, and then trace the exact item selected in the sample.

The Instrument (Questionnaires)

The study was therefore carried out in Jordan, and the results were obtained by way of a self-governing questionnaire, where respondents were asked to complete the survey themselves. The goal of this study is to reduce costs with the elimination of the respondent of devices and things, including computer software (Willett, 2017). The adapted questionnaire is essentially a combination of various previous research instruments on this phenomenon. These questionnaires are adapted to provide a clear understanding of the phenomenon and constructs of this research study in Jordan. Job performance consists of 6 items adopted from Dalal, Lam, Weiss, Welch, & Hulin, 2009. Role stressors consists of 20 items adopted from Bowling et al (2017), Thiagarajan, Chakrabarty & Taylor (2006), and Yada, Lu, Omori, Abe, Matsuo, Ishida & Katoh, (2015). Leadership style consists of 18 items, eighteen items adopted from Ch, Ahmad, Malik, & Batool, (2017); Hinkin, & Schriesheim, (2008). Workplace bullying consists of nine elements adopted from Notelaers, Van der Hoel & Einarsen, (2019). The researcher will use the Short Negative Acts Questionnaire-Revised (S-NAQ-R) instrument, which is the most widely used instrument for assessing bullying at the workplace. Short NAQ (S-NAQ, 9-items) describing negative acts of a person related as well as a work-related nature used by (Einarsen, Hoel, & Notelaers, 2009; Notelaers & Einarsen, 2008).

Data Analysis

The main purpose of this step of the analysis is to evaluate the validity and reliability of the items and the internal structure of the constructs that the instrument tests. An Exploratory Factor Analysis (EFA) to analyze the factor structure of the scale was performed to realize the concept. Next, to assess the reliability of the questionnaires, a reliability analysis was conducted.

Exploratory Factor Analysis (EFA)

This research used Exploratory Factor Analysis (EFA) to assess the construct's validity in Jordanian Universities. EFA is a method of data reduction used to minimize a large number of variables to a small collection of underlying factors summarizing the critical information in the variables (Richard and Dean, 2007). The Exploratory Factor Analysis (EFA) examines and tests the dimensionality of the objects measuring each construct in the analysis. Several studies, such as Hoque et al. (2017, 2018); Noor et al (2015), and Yahaya et al (2018), emphasize the need for the researcher to use the Exploratory Factor Analysis (EFA) method with each construct to assess if the dimensionality of the items has changed from the previous study where the dimensions were established. The dimensionality of things that change when the current study differs from the previous study in terms of the difference in industry, the difference in culture and socio-economic status between the two populations, and also the time lapse (duration) between the existing study and the previous studies. In other words, the dimensions obtained from previous studies might not hold especially when the current research is carried out in different environments and different industries. Factor analysis was most commonly used as an exploratory tool to summarize the function of a number of

variables (EFA). A Kaiser-Meyer-Olkin (KMO) test and Bartlett's Sphericity Test were initially performed to check if the data set was sufficient for factor analysis. Both measures seek to assess the adequacy of the sampling in order to evaluate the factorability of the matrix or data set as a whole (Richard and Dean, 2007). If Bartlett's sphericity test is broad and important and the KMO measure is greater than 0.50, the factorability in the data set can be presumed to exist. For the extraction of the underlying factors in this analysis, the Principal Axis Factoring (PAF) extraction method with Direct Oblimin rotation method was used. By integrating these two techniques, the value of the own values and the analysis of the Scree plot is obtained and then the number of factors in the data set can be obtained. To be counted as one element, the value of eigenvalues must surpass '1.' The Scree Plot technique was also used to validate the findings from the study of eigenvalues (Richard and Dean, 2007). To validate whether or not all of the factors derived from this study are accurate as suggested by MacCallum, Widaman, Zhang, and Hong (1999), the value of communality for each item must be within 0.6. Furthermore, items with communities of less than 0.6 range must be removed from the study when the sample size is above 377 samples. The sample size is good enough, because that a small number of items have very few factors each. The criteria used to evaluate the factors derived by the factor analysis in order to see whether it was reliable or not is by assessing the factor loading value for each element. Factor loadings can be determined by looking at the matrix table of trends. Field (2009) stated that the most suitable loading value for each item would exceed 0.3 and remove from this study the loading value of the item which is less than 0.30. The next test, the reliability review, was carried out on the collection of factors that were derived from this study to ensure that all items found in each factor correctly represent the measured construct (Sheridan et al., 2010).

Reliability Analysis

The accuracy of this research instrument used for this study purpose; the measurement of reliability has been carefully tested. The Cronbach's Alpha-Coefficient study was conducted to determine the measurement's reliability. According to Haron (2010), it argued that for a group of things to be considered a scale, the generally accepted social science cut-off point, alpha value should be 0.70 or higher, but others use 0.75 or 0.80, while others are as mild as 0.60. The Alpha values of Cronbach are very sensitive to the number of things in the scale, and the Alpha values of the Cronbach are each below 0.60. Those are deemed acceptable in this case

Results of Descriptive Statistics and their Respective Components

These constructs have 53 measuring items in the questionnaire. The EFA results in Table 1 showed the descriptive statistics for every item measuring the items of the constructs, the factor loadings of each item as well as the component generated from the EFA procedure. This construct was measured using the interval scale from 1 (strongly disagree) to 10 (strongly agree) with the given item statement (Awang et al., 2016; Hoque et al., 2018).

EFA Procedure

It is necessary to conduct a descriptive analysis of all the attributes of incubator success in order to obtain a general overview of how the 100 respondents understood and perceived Jordanian public universities success. Table 1 displays the descriptive results of this study's variables. The table displays the mean and the SD for all the research elements: Workplace Bullying (WPB), Job Performance (JP), Role Stressor (RS); (Role Ambiguity (RA), Role conflict

(RC), Role overload (RO), Leadership Style; (Autocratic Leadership Style (ALS), Democratic Leadership Style (DLS), Laissez faire Leadership Style (LLS). This study applied the interval scale between 1 (strongly disagree) and 10 (strongly agree) with the given element statement to measure this construct with its 53 elements in the instrument.

Table 1: descriptive results

Item	Item Statement	Mean	Std. Deviation
LS1	Manager avoids getting involved when issues arise	9.26	.758
LS2	Manager takes no action when problems become chronic	8.80	.919
LS3	Manager is absent when needed	8.70	.952
LS4	Manager fails to follow up requests for assistance	8.76	.852
LS5	Manager resists expressing views on important issues	8.93	.805
LS6	Manager avoids making decisions	8.99	.802
LS7	Manager delays responding to urgent questions	9.24	.862
LS8	Manager avoid from addressing work problems	8.76	.875
DS1	Manager provides freedom to staff for work independently.	8.53	.961
DS2	Manager takes opinions from staff	8.45	.906
DS3	Manager accepts the suggestions of staff	8.69	.985
DS4	Manager is very cooperative and supportive	8.62	.794
DS5	Manager listens the issues of staff with care	8.82	.851
AL1	Manager likes to give orders only	8.89	.875
AL2	Manager makes all decisions by himself	8.77	.885
AL3	Manager has full authority	8.90	.821
AL4	Manager decides the operational objectives	8.96	.826
AL5	Manager provides opportunities to staff to leads	8.80	.845
RO 1	My job requires thinking during work hours.	9.04	.963
RO 2	My job requires concentration.	9.07	.869
RO 3	My job requires working hard.	8.82	.857
RO 4	My job has large amount of work.	9.09	.878
RO 5	My job needs a lot of physical work.	8.90	.893
RO 6	My job needs extra time to get job done.	8.95	.852
RO 7	My job requires high level of knowledge	8.78	.973
RC1	The assignment without workforce to complete	9.13	.820
RC2	To buck a rule to carry out an assignment	8.75	.919
RC3	Work with groups who operate quite differently	8.89	.898

RC4	Receive incompatible requests from people	8.84	.831
RC5	Do things that only accepted by few staff	8.84	.829
RC6	Assignment without adequate to execute	9.26	.758
RC7	I work on unnecessary things	8.53	.961
RA1	I feel certain about how much authority I have	8.45	.906
RA2	Clear plan goals and objectives exist for my job	8.69	.985
RA3	I know that I have divided my time properly	8.62	.794
RA4	I know what my responsibilities are	8.82	.851
RA5	I know exactly what is expected of me	8.92	.963
RA6	Explanation is clear of what has to be done	8.89	.875
WB 1	Withholding information that affects performance	9.04	.830
WB 2	Spreading of gossip and rumors about you	9.07	.869
WB 3	Being ignored by people at work	8.82	.857
WB 4	Having offensive remarks made about you	9.09	.878
WB 5	Being shouted or being the target of anger	8.90	.893
WB 6	Repeated reminders of your errors or mistakes	8.95	.852
WB 7	Facing a hostile reaction when you approach others	8.78	.973
WB 8	Persistent criticism of your work and performance	8.93	.888
WB 9	Being the subject of unwanted practical jokes	9.07	.830
JP1	Staff volunteered for additional work tasks.	8.89	.875
JP2	Staff went beyond what required for the work task	8.77	.885
JP3	Staff defended the university policies.	8.90	.821
JP4	Staff chose to work rather than to take a break.	8.96	.826
JP5	Staff persisted enthusiastically in completing a task.	8.80	.845
JP6	Staff spoke highly about the university to others.	9.07	.802

The mean score must be greater than 3 and the SD must be near or less than 1 (Hair et al. 2006). The other constructs also have evaluation values of more than 3, which shows that the respondents gave a slightly positive evaluation to these measures too. Furthermore, all the constructs have SD values of less than 1.

The Results of Exploratory Factor Analysis (EFA) Validity

The Exploratory Factor Analysis (EFA) using the extraction method of Principal Component with Varimax (Variation Maximization) Rotation was performed on these 4 constructs: Job Performance (6 items); Role Stressor (20 items); Leadership Style (18 items); and Workplace Bullying (9 items). The results in Table 2 indicate that the Bartlett's Test of Sphericity is significant (P-Value < 0.05). Furthermore, the measure of sampling adequacy by Kaiser-Meyer-Olkin (KMO) is excellent since it exceeded the required value of 0.6 (Awang, 2010,

2012; Hoque et al., 2015; and Noor et al., 2015). These two results (Bartlett’s Test is significant and KMO > 0.6) indicate that the data is adequate to proceed further with the data reduction procedure in EFA (Yahaya et al., 2018).

Table 2: The KMO and Bartlett’s Test Score for the Variables

Variables	KMO	Sign	Eigen values	% of Variance Explained
Job Performance	0.820.	0.000	3.207	66.158
Role Stressor	0.897	0.000	3.914	67.764
Leadership Style	0.926	0.000	5.932	69.318
Workplace Bullying	0.909	0.000	5.436	60.395

The Bartlett’s test of sphericity for all constructs was 0.000, below the standard significance level of 0.05 as recommended by Williams et al. (2012). The resulting values of KMO ranged from 0.820 to 0.926, which were above the cut-off value of 0.6 as recommended by Blaike (2003).

Based on the validity results, the Eigen values of all constructs exceeded the cut-off 1 as recommended by Tabachnick and Fidell (2007) as they ranged from 3.207 to 5.932. The values of variance for all constructs were all above the cut-off 50 percent as recommended by Diekhoff (1992), and they ranged from 60.395 % to 69.318 %. These results indicated that the study yielded reliable factors.

Figure 1,2,3,4 as shown below demonstrates the components that resulted from the EFA procedure for the elements. EFA procedure has grouped 53 items into four components with its own four components elements. The rotated component matrix shall indicate every element with it is exact belonging to every component (Bahkia et al., 2019; Hoque et al., 2017; Hoque et al., 2018).

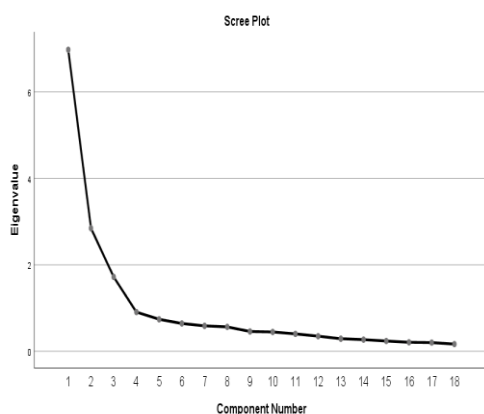


Figure 1: The Scree Plot for Leadership Styles Items

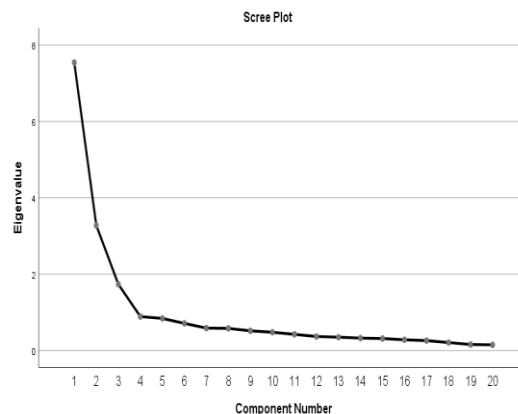


Figure 2: The Scree Plot for Role Stressors Items

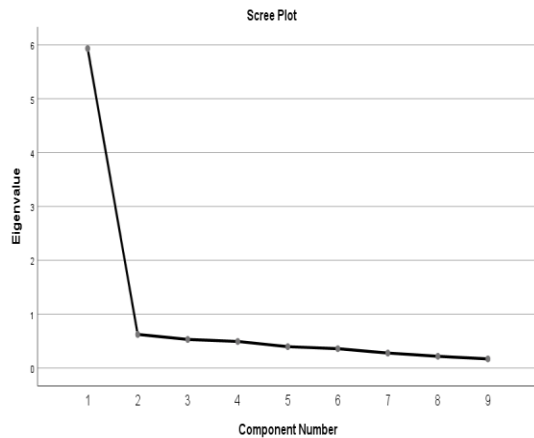


Figure 3: The Scree Plot for Workplace Bullying Items

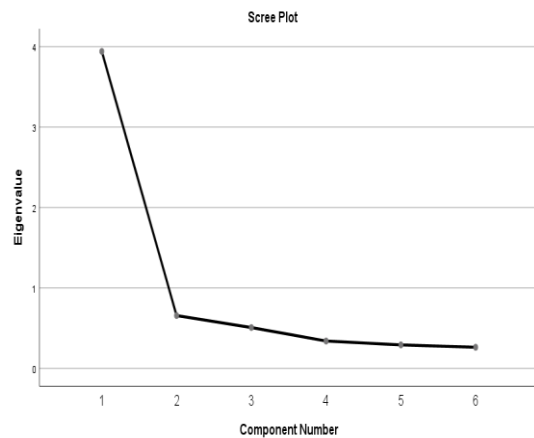


Figure 4: The Scree Plot for Job Performance

Results of Reliability Analysis

The study needs to compute the value of Cronbach’s Alpha which reflect the Internal Reliability for the retained items in measuring this latent construct. The internal reliability or internal consistency indicates how strong the respective items are holding together in measuring the respective construct.

Internal consistency assessment using Cronbach’s alpha was conducted in this stage on all the items in order to assess the overall reliability. For the confirmation of the consistency of the items measuring the same construct, it is vital for the composite reliability to be 0.7 or over. (Hair et al. 2014). As shown in Table 3, the Cronbach’s alpha test indicates that all items values exceeded 0.7, ranging between 0.858 and 0.923.

Table 3: The Internal Reliability for the Variables

Variables	Cronbach's Alpha
Job Performance	0.858
Role Stressor	0.870
Leadership Style	0.923
Workplace Bullying	0.909

Conclusion

The instrument used in the study measured four constructs including Job Performance (JB), Role Stressor (RS); Role Ambiguity (RA), Role conflict (RC), Role overload (RO), Leadership Style (LS) Autocratic Leadership Style (ALS), Democratic Leadership Style (DLS), Laissez fair Leadership Style (LLS), and Workplace Bullying (WPB). The Exploratory Factor Analysis (EFA) was used to examine and test the dimensionality of objects measuring each construct in the analysis.

For the extraction of the underlying factors in this analysis, the Principal Axis Factoring (PAF) extraction method and the Direct Oblimin rotation method were used. By integrating these two techniques, the value of the own values and the analysis of the Scree plot were obtained, thus the number of factors in the data set will be easily obtained. The sample size is appropriate, and a small number of items have few factors. The criteria used to evaluate the factors derived by the factor analysis were by assessing the factor loading value for each element. It was discovered that factor loadings could be determined by looking at the matrix table of trends.

As an EFA result, all the instruments of the four constructs explained that the variance was above 60 percent. However, all four constructs have been above 0.7 delivering high reliability which is their Cronbach's Alpha. In addition, data encompassing this research was suitable for running the EFA on the basis of descriptive analysis. The 100 respondents enough for EFA as sample will help figure out whether or not the factor structure and individual items are valid. Those instruments are also useful to the construction of universities. These instruments offer the universities an advantage because it has been built based on viewpoints that include potential managerial staff. The present study however has its own limitation. The first limitation relates to the approaches used, to the EFA and to the study of reliability. Such two techniques are inadequate for evaluating the instrument's theoretical base. This study therefore suggests future work to be conducted using Confirmatory Factor Analysis (CFA) to add and enhance understanding in this field. This study's generalizability is subject to some limitations relating to its results. For example, the study only includes universities in ten universities in Jordan, covering the areas of all Jordanian universities. Based on research limitations in the sense of generalizability, this study indicates that it would be feasible to undertake future studies at all universities in Jordan, rather than concentrate on the ten universities. In this case, it is recommended to increase the number of universities as a sample study for future studies to expand the results in the same field and allow the evaluation to be carried out via further advanced analysis.

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