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The Effect of Transformational Leadership on Organizational Innovation in Higher Education: The Case of Developing Countries

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Abstract

The purpose of this study is to investigate the effect of transformational leadership on organizational innovation in higher education in Yemen. Evaluation of the proposed model was done through a questionnaire survey with data collected from 279 valid responses among managerial employees within the Sana'a University departments. The analysis examined the relationship between the variables of the proposed model, and includes confirmatory factor analysis (CFA), and structural equation modelling (SEM) via AMOS. The results of the analysis show that the data fit the proposed model well, including two second-order constructs; transformational leadership and organizational innovation. The model proposed by the research, as evidenced by the goodness of fit of the model to the data, and the findings of the multivariate analysis demonstrated main results that transformational leadership has a positive impact on organizational innovation. The theoretical and practical implications are discussed.

Keywords: Transformational leadership; organizational innovation; higher education; Yemen

1. Introduction

The last few decades of this twenty-first century have witnessed an acceleration of both development and resultant change as a result of an explosion of knowledge and a revolution in information availability and ease of communication, coupled with increased demands on leaders and the subsequent impact on the success of their organizations. Today's organizations face many challenges, operating in dynamic environments characterized by rapid technological change, a globalizing economic environment, shortening product life cycles, and wide access to information (Abou-Shouk and Khalifa, 2017; Khalifa and Abou-Shouk, 2014; Abd-Elaziz, et al. 2015; Ameen, Almulla, Maram, Al-Shibami, & Ghosh, 2018). Organizational success is measured by how they face or cope with these challenges and adapt to them (Alsalami, Behery, & Abdullah, 2014; Aragón-Correa, García-Morales, & Cordón-Pozo, 2007; Radzi & Hui, 2013; Khalifa and Mewad, 2017;.

Innovation and flexibility when encountering changes to the business environment may be part of the solution (Shamsi et al., 2018; Qoura and Khalifa, 2016; Haddad, Ameen, & Mukred, 2018). It can play an effective role in economic growth and development, but it needs to foster and encourage efforts both at the individual and at the organizational level (Mokhber, Vakilbashi, & Ismail, 2015). It can also improve customer lifestyle if it offers something truly different in the market (Maughan, 2012). According to Prather (2010), 'innovation is a social process requiring an effective team to bring a good idea to fruition in the marketplace'.

Jaskyte (2004) posits that transformational leaders motivate their employees to contribute and achieve their organizational goals through four unique behavioral components: charisma, intellectual stimulation, consideration, and inspiration. Also, if transformational leaders indirectly support innovation via influencing their followers' commitments and build an organizational atmosphere which motivates them to generate new ideas, this will sustain and ensure the long-term survival of the organization (B. J. Avolio, Zhu, Koh, & Puja Bhatia, 2004). As a result, their employees are satisfied while working and make the extra effort to suggest innovations and achieve better work outcomes (Elenkov & Manev, 2005). Consequently, to achieve the purpose of this study, the focus will be on transformational leadership as a type of leadership style that has a direct influence on organizational innovation.

The challenges faced by public organizations to meet the demands of the global market-place are many (Mohamed et al., 2018), and require organizations to adopt new ways to both encourage and support innovation among their employees (Nusair, Ababneh, & Bae, 2012; Al-Obthani & Ameen, 2018).

. Based on the Global Innovation Index 2015, which ranks the innovative capability of world economies', and measures, among other factors, the level of research and development, Yemen is listed as having below-par performance compared to income levels, and ranked 137th out of 141 countries. This indicates that there is a lot of room for innovation and the message for Yemeni organizations is that they need to address this in order to compete with the world at large.

Most prior research has focused on the West, with very limited studies in the Middle Eastern context. These Western studies examined the relationship between transformational leadership and organizational innovation fields such as education, and health. It would be interesting to look at how transformational leadership could improve organizational innovation in Middle Eastern countries like Yemen. Therefore, this study attempts to achieve the research objective by examining the effect of transformational leadership and organizational innovation in Sana'a University in Yemen.

2. Literature Review

2.1 Organizational Innovation

Innovation has become a key mantra for a vast number of organizations in recent years (Damirch, Rahimi, & Seyyedi, 2011). Indeed, the importance of innovation for organizations is reflected in the increased empirical attention it has received from a number of researchers (Janssen, van de Vliert, & West, 2004). Hartley (2005) argues that the explosion in interest in innovation derives from need for organizational survival in both the private and public sectors. Schumpeter & Elliott (1934) describe the innovation process as the creation of a new brand, as well as that brand's effect on economic development. Pasche & Magnusson (2011) classify organizational innovation as being radical or incremental. Whereas radical innovation requires entirely new knowledge and resources (i.e. competence - destroying), incremental innovation builds upon existing knowledge and resources. In a Felix, Jacqueline, & Jillian (2005) study, organizational innovation was distinctively classified into three dimensions, namely: product innovation, process innovation and administrative innovation.

Product innovation refers to how a new product is developed to become commercially viable, value and filling a niche in both the needs of the individual or the wider market (Damanpour & Gopalakrishnan, 2001; Ameen & Ahmad, 2012). It begins by analyzing an existing product through research and practical experimentation by developing prototypes in order to produce something better.

Process innovation is viewed as a creation of a new process or improvement to an existing process (Leonard & Waldman, 2007). It requires the adopting new or improved processes, which may include a change in how an item is manufactured or even designing new software (Ke-xin, De-hua, Ren-feng, & Bai-zhou, 2006).

Administrative innovation is viewed as making changes to the way an organization is structured or administered, how employees are rewarded, how information is handled and disseminated, and how basic work activities are managed (Ameen, Almari, & Isaac, 2018 ;Chew, 2000; Damanpour & Evan, 1984).

2.2 Transformational Leadership

Leadership is the art of influencing and guiding followers to achieve common goals that contribute to organizational success (Makri & Scandura, 2010). Though leadership relates to the influence and guidance of employees in a general sense, past research has identified different types of leadership styles that can contribute to organizational development in different ways (Hirtz, Murray, & Riordan, 2007). Most notably, is transactional and transformational leadership, based on work by Weber (1947) and Burns (1978), and which represent two styles that have been studied extensively in the literature. Transformational leadership is characterized by high levels of motivation and morale among leaders and followers (Rahimi, Damirchi, & Seyyedi, 2011; Ameen & Ahmad, 2013). These positive outcomes are largely attributable to the personality of the leaders, the clarity of their vision, the ability to change the expectations of their followers, and the drive to motivate followers to achieve common goals. It is often identified through the following four components (B. J. Avolio & Bass, 2004).

Idealized Influence (divided into sub-dimensions of idealized attributes and idealized behavior): Transformational leaders display behaviors of honesty, integrity, power, confidence, have a collective responsibility and genuine care for others, and are admired by their employees. Idealized Influence (Attribute) refers to leaders who have the ability to build trust in their followers while Idealized Influence (Behavior) refers to leaders who act with integrity (Ameen & Ahmad, 2014; Nhat, 2016).

Inspirational Motivation: Transformational leaders inspire followers by providing meaning and challenge to the work, communicating high expectations for the group, sharing vision, and arousing enthusiasm and optimism about the future of the organization (Nhat, 2016).

Intellectual Stimulation: Transformational leaders stimulate innovation and creativity of followers by promoting critical thinking to solve problems, questioning assumptions, approaching old situations in new ways, and soliciting creative ideas to problems (Nhat, 2016).

Individual Consideration: Transformational leaders pay close attention to the individual needs of followers for achievement and growth. They act as a mentor and coach, recognizing individual abilities, aspirations, and strengths (Nhat, 2016).

Throughout the literature, transformational leadership has been revealed as a powerful model of leadership in military, political, and industrial organizational environments (Al-Tahitah et al., 2018; A. H. Aldholay, Isaac, Abdullah, & Ramayah, 2018 ; Avolio & Bass, 2004; Bass, 1985; Bernard M. Bass & Ronald E. Riggio, 2006; Ameen & Kamsuriah, 2017; Abdulrab et al., 2017). Therefore, the following hypothesis is proposed:

H1. Ttransformational leadership has a positive effect on organizational innovation.

3. Research Method

3.1 Overview of the Proposed Research Model

This study contributes to the body of knowledge by conceptualizing the relationship between transformational leadership and organizational innovation. Therefore, with respect to the literature on both these, and based on the theoretical and practical gaps of previous research, the following conceptual framework has been developed (Figure 1).

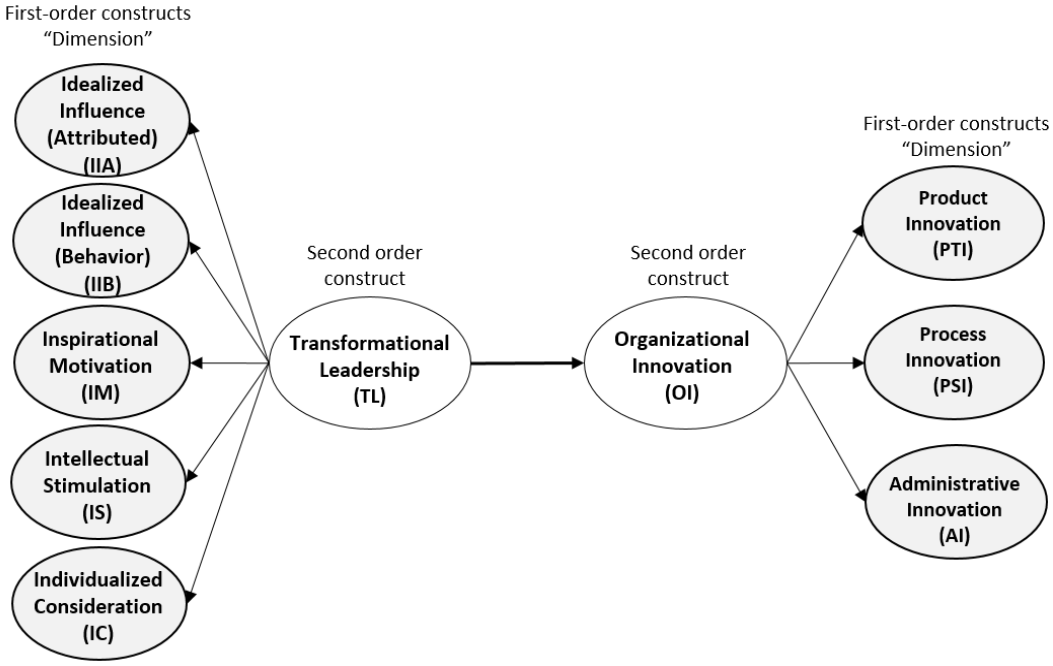

Figure 1: Research model

3.2. Development of Instrument

For this study, a questionnaire was developed with questions using related literature and following previous studies conducted by many organizations. Four steps were involved: First, measurements used in this study of independent and dependent variables were adapted from inspiring studies (B. J. Avolio & Bass, 2004; Tsai et al., 2008). The internal consistency reliability value for each instrument was observed based on the results of earlier studies and since the measurement for each construct was above the acceptable limit of internal consistency value, i.e. above 0.6, each was considered reliable and used in this study. Second, the content validity of all measures was examined by assessing the suitability of items in representing the operational definition of each dimension. The researcher identified items that were designed to measure each of the hypothesized constructs or variables based on seminal works by prominent scholars in their respective studies (B. J. Avolio & Bass, 2004; Tsai et al., 2008) as appendix A shows. Accordingly, a total of 33 items were used in the questionnaire. Third, the English language was retained as the medium of communication in the questionnaire because most of Sana'a University's top managerial employees are expected to be proficient in the language. Finally, respondents would be requested to respond to the items by indicating their level of agreement or disagreement using a five-point Likert scale, commonly used in studies of this nature (Dawes, 2008; Dillman, Smyth, & Christian, 2008; Fink, 2003) as it offers a sufficient range of choices. This scale of the measurement in this research was also used in previous studies.

3.3. Data Collection

A survey was used as the main research tool in this study, because it utilizes a range of basic procedures to acquire information from people in their natural environment (Graziano & Raulin, 2010). In this study, a total of 330 questionnaires were distributed to Sana'a University 'managerial employees' in various departments, delivered by hand to and subsequently collected from staff at their work office during working hours, in order to guarantee that the questionnaire reached the staff and to ensure collection once the participants had completed it. Brownell & Naik (2001) state that through this control, the level of response is greatly improved. Another advantage was the knowledge the researcher gained of those who completed the questionnaire (Brownell & Naik, 2001).

The survey was conducted over 90 days and a reminder was given once each week. Of the 330 questionnaires distributed to various departments, 283 were returned, making a response rate of 86%. However, only 279 (85%) were actually usable for this study. Table 1 presents the profile of respondents 71% (198) are male with 29% (81) female. The majority of respondents were aged from 40-45 years (36.9%), followed by 35-39 years (31.2%); 30-34 years (20.4%), 25-29 years (8.2%), and above 45 years (3.2%). In the question related to marital status, 86.0% of them are married, 9.0% are single, 4.3% are widowed, and 0.7% are divorced. In terms of educational background, the majority of the responders (42.3%) had a bachelor degree, 23.3% had a PhD, 21.9% had a Masters and 12.5% had a diploma. Therefore, the sample of this study is mostly dominated by those with bachelor degree or PhD.

To the question on working experience, 38.4% of the respondents stated that they have 6 to 10 years' experience, 27.6% have 11 to 15 years' experience, 21.1% have 1 to 5 years' experience, 10.4% have 16 and above years' experience, while only 2.5% of the respondents had less than one year. In terms of position, 65.6% of them are heads of the department, 21.9% are managers, 10.4% are directors and the remainder (2.2%) are top management. Therefore, heads of departments and managers dominate the sample of this study.

Table 1:*Summary of demographic profile of respondents*

No	Demographic Item	Categories	Frequency	Percentage
1	Gender	1. Male	198	71.0
		2. Female	81	29.0
2	Age	1. 25 - 29 years	23	8.2
		2. 30 - 34 years	57	20.4
		3. 35 - 39 years	87	31.2
		4. 40 - 45 years	103	36.9
		5.Above 45	9	3.2
3	Education background	1. Diploma	35	12.5
		2. Bachelor	118	42.3
		3. Master	61	21.9
		4. PhD/DBA	65	23.3
4	Marital status	1. Single	25	9.0
		2. Married	240	86.0
		3. Divorced	2	0.7
		4. Widowed	12	4.3
5	Working experience	1. below one year	7	2.5
		2. 1 - 5 years	59	21.1
		3. 6 - 10 years	107	38.4
		4. 11 - 15 years	77	27.6
		5. 16 and above	29	10.4
6	Postion	1. Top management	6	2.2
		2. Director	29	10.4
		3. Manager	61	21.9
		4. Head of the department	183	65.6

4. Data Analysis and Results

4.1 Descriptive Analysis

Table 1 presents the mean and standard deviation of each variable in the current study. Respondents were asked to indicate their opinion based on a 5-point scale ranging from 1 (strongly disagree) to 5` (strongly agree). Idealized influence (attribute) recorded the highest mean score of 3.960 out of 5.0, with a standard deviation of 1.168, indicating that the respondents answered the questions independently and selflessly. Idealized influence (behavior) recorded a mean score of 3.747 out of 5.0 with a standard deviation of 1.081,

thus indicating that the respondents acknowledged their responsibility to their work team and answered truly in accordance with their values.

Inspirational motivation recorded a mean score of 5.20 out of 7.0 with a standard deviation of 1.506, indicates that the respondents were optimistic and enthusiastic about the future and what needs to be accomplished. Mean scores for intellectual stimulation (3.725) with a standard deviation of 1.020, indicates that the respondents are not committed to just one opinion but are willing to examine others and revise their opinion if necessary. The results also indicated that the overall respondent mean score for individualized consideration in the current study was 3.844 with a standard deviation of 1.022, indicating that respondents not only consider each person separately and not as part of a homogenous whole, but also help others to develop their strengths. Mean scores for product innovation (3.439), process innovation (3.471) and administrative innovation (3.302) out of 5.0 points with standard deviations of 0.984, 0.986 and 0.858 respectively, indicate that respondents agree that in their institution, new technology is adapted for improving work processes and developing new products, while administrative support is always available.

4.2 Measurement Model Assessment and *Confirmatory Factor Analysis (CFA)*

As shown in Table 2, because all the goodness-of-fit indices exceeded the levels of acceptance determined by earlier researchers, this indicated the collected data fit reasonably well with the measurement used by the current model. (X^2/df = 1.936, CFI = 0.963, RMSEA = 0.058, SRMR = 0.027, NFI=0.926, TLI=0.958, IFI=0.963, PNFI=0.819, and PGFI=0.688). However, in this study, since GFI and AGFI do not fit (0.826 and 0.791 respectively), Sharma, Mukherjee, Kumar, & Dillon (2005) recommended that these indexes should not be used because of their sensitivity and the fact that their use is no longer popular. The Absolute fit indices show that the chi-square is not significant (p value should be > 0.5). However, the model still fits because large samples nearly always cause the Chi-Square statistic to reject the model (Bentler & G.Bonnet, 1980; Jöreskog & Sörbom, 1993). The chi-square is sensitive to sample size >200 (Byrne, 2010), and the sample size for this study is 279. Thus, the psychometric properties could be tested and examined for construct reliability, indicator reliability, convergent validity, and discriminant validity.

Table 2: *Goodness-of-fit indices for the measurement model*

Fit Index	Cited	Admissibility	Result	Fit (Yes/No)
X^2			904.203	
DF			647	
P value		>.05	.000	No
X^2/DF	(Kline, 2010)	1.00 - 5.00	**1.936**	**Yes**
RMSEA	(Steiger, 1990)	<.08	**.058**	**Yes**
SRMR	(Hu & Bentler, 1999)	<.08	.027	Yes
GFI	(Jöreskog & Sörbom, 1993)	>.90	.826	No
AGFI	(Jöreskog & Sörbom, 1993)	>.80	.791	No
NFI	(Bentler & G.Bonnet, 1980)	>.80	.926	Yes
PNFI	(Bentler & G.Bonnet, 1980)	>.05	.819	Yes
IFI	(Bollen, 1990)	>.90	.963	Yes
TLI	(Tucker & Lewis, 1973)	>.90	.958	Yes
CFI	(Byrne, 2010)	>.90	**.963**	**Yes**
PGFI	(James, Muliak, & Brett, 1982)	>.50	.688	Yes

Note: X^2 = Chi Square, DF = Degree of freedom, GFI = Goodness-of-fit, NFI = Normed fit index, IFI = the increment fit index, TLI = Tucker-Lewis coefficient Index, CFI = Comparative-fit-index, RMSEA = Root Mean Square Error of Approximation, SRMR: Standardized Root Mean Square Residual, PNFI = Parsimony Normed Fit Index, AGFI =Adjusted Goodness of Fit Index.
The indexes in bold are recommended since they are frequently reported in literature (Awang, 2014).

For *Construct reliability*, this study tested the individual *Cronbach's alpha* coefficients to measure the reliability of each of the core variables in the measurement model. The results indicate that all the individual Cronbach's alpha coefficients of the constructs ranging from 0.908 to 0.970 were greater than the recommended level exceeded of 0.7, the level recommended (Kannana & Tan, 2005; Nunnally & Bernstein, 1994). Additionally, for testing construct reliability, all the *composite reliability* (CR) values ranging from 0.914 to 0.971 were higher than 0.7 (Kline, 2010; Gefen, Straub, & Boudreau, 2000), which adequately indicates that construct reliability is fulfilled as shown in Table 3. Therefore, the achieved Cronbach's Alpha and CR for all constructs were considered to be sufficiently error-free.

Factor loading was used to test *indicator reliability*. High loadings on a construct indicate that the associated indicators seem to have much in common, which is captured by the construct (Hair, Hult, Ringle, & Sarstedt, 2017). Factor loadings greater than 0.50 were considered to be very significant (Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., and Tatham, 2010). Since the recommended value of 0.5 was exceeded for all items, as shown in Table 3, the loadings for all items in the model have therefore fulfilled all the requirements without being eliminated from the scale.

This study used the average variance extracted (AVE) to test *convergent validity*, and it indicated that all AVE values were higher than the recommended value of 0.50 (Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., and Tatham, 2010) ranging from 0.723 to 0.893. The convergent validity for all constructs has been successfully fulfilled and adequate convergent validity exhibited as Table 3 shows.

Table 3: *Mean, standard deviation, loading, cronbach's Alpha, CR and AVE*

Second-order construct	First-order constructs	Item	Loading (> 0.5)	M	SD	α (> 0.7)	CR (> 0.7)	AVE (> 0.5)
Transformational leadership (TL)	Idealized influence (attributed) (IIA)	IIA1	0.96	3.960	1.168	0.970	0.971	0.893
		IIA2	0.94					
		IIA3	0.95					
		IIA4	0.93					
	Idealized influence (behaviour) (IIB)	IIB1	0.89	3.747	1.081	0.954	0.954	0.838
		IIB2	0.92					
		IIB3	0.92					
		IIB4	0.93					
	Inspirational motivation (IM)	IM1	0.90	3.938	1.074	0.955	0.957	0.846
		IM2	0.95					
		IM3	0.90					
		IM4	0.92					
	Intellectual stimulation (IS)	IS1	0.93	3.725	1.020	0.954	0.954	0.837
		IS2	0.92					
		IS3	0.88					
		IS4	0.93					
	Individualized consideration (IC)	IC1	0.93	3.844	1.022	0.940	0.941	0.800
		IC2	0.81					
		IC3	0.91					
		IC4	0.92					
Organizational innovation (OI)	Product Innovation (PTI)	PTI1	0.94	3.439	0.984	0.908	0.914	0.782
		PTI2	0.92					
		PTI3	0.79					
	Process Innovation (PSI)	PSI1	0.92	3.471	0.986	0.939	0.940	0.796
		PSI2	0.90					
		PSI3	0.85					
		PSI4	0.90					
	Administrative Innovation (AI)	AI1	0.86	3.302	0.858	0.939	0.940	0.723
		AI2	0.86					
		AI3	0.84					
		AI4	0.82					
		AI5	0.87					
		AI6	0.85					

Note: M=Mean; **SD**=Standard Deviation, **α**= Cronbach's alpha**; CR =** Composite Reliability, **AVE =** Average Variance Extracted

The *discriminant validity* of the measurement model was checked using Fornell-Larcker criterion. Because the inter-factor correlations, as shown in Table 4, are less than the square root of the average variance extracted estimates, this shows that the constructs have a strong relationship with their respective indicators in comparison with other constructs of the model (Fornell & Larcker, 1981), and therefore indicate a positive discriminant validity (Hair et al., 2017).

Table 4: *Results of discriminant validity by Fornell-Larcker criterion for the model*

	Factors	*1* **PSI**	*2* **IIB**	*3* **IIA**	*4* **IS**	*5* **IC**	*6* **PTI**	*7* **AI**	*8* **IM**
1	**PSI**	**0.892**							
2	**IIB**	0.628	**0.915**						
3	**IIA**	0.633	0.750	**0.945**					
4	**IS**	0.658	0.837	0.795	**0.915**				
5	**IC**	0.693	0.846	0.835	0.868	**0.895**			
6	**PTI**	0.839	0.682	0.643	0.638	0.704	**0.884**		
7	**AI**	0.834	0.626	0.629	0.638	0.685	0.808	**0.850**	
8	**IM**	0.663	0.833	0.832	0.852	0.894	0.706	0.640	**0.920**

Note: Note: Diagonals represent the square root of the average variance extracted while the other entries represent the correlations.
Key: IIA: idealized influence (attributed), IIB: idealized influence (behavior), IM: inspirational motivation, IS: intellectual stimulation, IC: individualized consideration, PTI: product innovation, PSI: Process Innovation, AI: administrative innovation

4.3 Structural Model Assessment

The goodness-of-fit of the structural model was comparable to the previous CFA measurement model. In this structural model, the values are recorded as $X^2/df = 1.911$, CFI = 0.962, and RMSEA = 0.057. Because there is adequate fit, as indicated by these indices, between the hypothesised model and the data collected (Byrne, 2010). An examination of the path coefficients could proceed for the structural model.

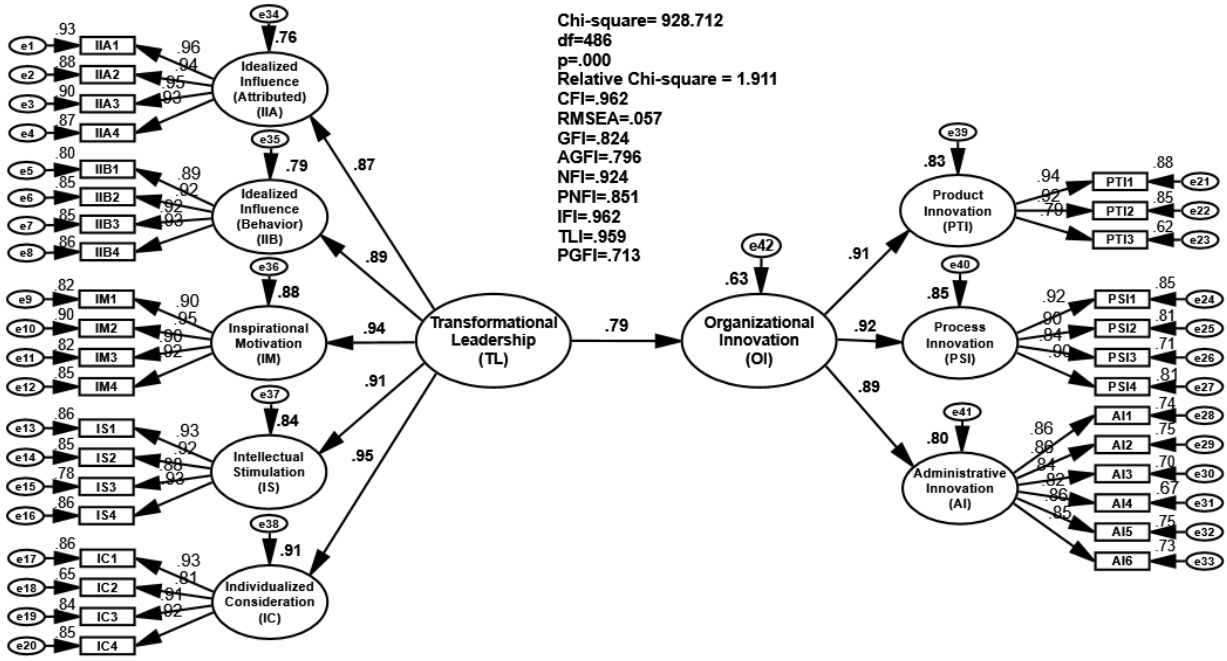

Figure 2: Research structural model results

4.3.1 Hypotheses Tests

The hypothesis of this study was tested using structural equation modeling via AMOS as presented in Figure 2. The structural model assessment as shown in Table 5 provides the indication of the hypothesis tests. Transformational leadership is significantly predicting organizational innovation, hence, H1 is accepted (β = .79, p <0.001),

Table 5: *Structural path analysis result*

#	Hypothesis	Dependent variables		Independent variables	Estimate B (path coefficient)	S.E	C.R (t-value)	Decision
1	H1	OI	<---	TL	0.79	0.041	11.681***	Supported

***p<.001; **p<.01; *p<.05
S.E = Standard Error, C.R = Critical Ratio
Key: TL: transformational leadership; OI: organizational innovation

4.3.2 Coefficient of Determination R^2: the Variance Explained

The R^2 value indicates the amount of variance of dependent variables which is explained by the independent variables. Hence, a larger R^2 value increases the predictive ability of the structural model. It is crucial to ensure that the R^2 values should be high enough for the model to achieve a minimum level of explanatory power (Urbach & Ahlemann, 2010). Falk and Miller (1992) recommended that the R^2 values should be equal to or greater than 0.10 in order for the explained variance of a particular endogenous construct to be deemed adequate. Cohen (1988b) suggested that R^2 is substantial when it is greater than 0.26. with acceptable power above 0.02, and according to Chin (1998) R^2 is substantial when it is greater than 0.65 with acceptable power above 0.19. Conversely, Hair et al. (2013) recommended that R^2 has to be larger than 0.75 in order to be deemed substantial, with acceptable power above 0.25. Table 6 shows the result of R^2 from the structural model, and indicates that all the R^2 values are high enough for the model to achieve an acceptable level of explanatory power.

Table 6: *Coefficient of determination result R^2*

exogenous construct	endogenous construct	R^2	Cohen (1988b)	Chin (1998)	Hair et al., (2013)
TL	OI	.63	Substantial	Substantial	Moderate

Key: TL: transformational leadership; OI: organizational innovation

5. Discussion and Implications

5.1 Discussion

Past researchers have argued that transformational leaders increase employee motivation, morale, and performance through four behavioral components: (idealized influence, inspirational motivation, intellectual stimulation, and individual consideration). In turn, these outcomes can lead to organizational innovation and long-term survival (Damirch et al., 2011; Gumusluoğlu & Ilsev, 2009; Jung, Chow, & Wu, 2003).

The major purpose of the study is to investigate the effect of transformational leadership in significantly predicting organizational innovation in higher education in Sana'a University in Yemen. Transformational leadership introduced five dimensions (idealized influence, attributed charisma, inspirational motivation, intellectual stimulation, and individualized consideration) and organizational innovation components (product innovation, process innovation and administrative innovation). This study discusses its findings based on the main objectives mentioned earlier.

***Findings related to objective*:** The hypothesis anticipated a positive effect of transformational leadership on organizational innovation. This hypothesis was substantiated as transformational leadership had a significant and positive impact on organizational innovation. Past empirical literature exhibits associations between transformational leadership and innovation. Lee and Jung (2006) found transformational leadership promoted innovative abilities of employees. However, only a few studies have also examined the relationship between transformational leadership and organizational innovation, For instance, Sosik, Kahai, & Avolio, (1998) claimed that transformational leaders encourage creative ideas that promote innovations within organizations. Gumusluoğlu & Ilsev (2009) also found transformational leadership to positively and significantly affect an organization's tendency to innovate. This is consistent with the finding of a study conducted Mokhber et al., (2015) who found a significant positive effect of transformational leadership on organizational innovation; and studies by Jung et al. (2003) which revealed a positive and significant relationship between transformational leadership and a firm's innovation. Also, research by (Hussain, Talib, & Shah, 2015).

5.2 Implications for Research

The main contribution of this research is the effect of transformational leadership and organizational innovation, with important theoretical contributions in terms of highlighting that transformational leadership contribute significantly to organizational innovation.

This study provides evidence of research which has synthesized empirical research, theories and ideas from various sources of academic disciplines. It will contribute to the existing body of knowledge, especially on transformational leadership and organizational innovation, and lead to a possible extension of study or development in this area or topic.

This study has also reaffirmed the applicability of the theory to government organizations and developing countries, and undoubtedly, will provide not only better insights for researchers but also could be used as reference for further research (Aldholay, Isaac, Abdullah, Alrajawy, & Nusari, 2018; Mutahar, Daud, Ramayah, Isaac, & Alrajawy, 2017).

5.3 Implication for practice

This research focused on how to guide the Yemeni public sector's transformational leadership. At the same time, it seeks to provide leaders with a clear insight into how to shape and influence the work environment to make it conducive to innovation (A. Aldholay, Isaac, Abdullah, Abdulsalam, & Al-Shibami, 2018). It demonstrates the importance of organizational innovation for the success, survival and competitive advantage both for organizations as well as for a developing a strong economy.

This research provides evidence on the impact of organizational innovation and its ability to facilitate the development of leadership among employees in the public sector. Moreover, it highlights how a good relationship among members of an organization, or encouragement for managers and leaders to inspire their followers, learn, and acquire transformational leadership behaviors in order to promote innovation of among their followers, will achieve organizational innovation in the long term.

6. Limitations and Suggestions for Future Work

Despite its theoretical and practical contributions, this study does have a number of limitations. First, the study focused exclusively on Sana'a University and neglected to include data from other universities in the analysis. This limitation indicates a need to replicate the analysis in other universities in Yemen (A. H. Aldholay, Abdullah, Ramayah, Isaac, & Mutahar, 2018). As such, future researchers should collect data from different universities in Yemen, as well as other universities in the Middle East and around the world. This broader scope can provide a more comprehensive understanding of organizational difficulties and leadership styles.

Second, most of the literature related to transformational leadership and organizational innovation has focused on Western countries. Because the insights produced by these studies may not be applicable to Yemen, due to cultural and contextual differences between Arab and Western countries, this limitation may lead to differences in the results and analysis.

One of the limitations of this study is that the data gathered was cross-sectional rather than longitudinal in nature. The longitudinal method might improve the understanding of the associations and the causality between variables (Isaac, Abdullah, Ramayah, & Mutahar, 2017; Isaac, Abdullah, Ramayah, Mutahar, & Alrajawy, 2017; Isaac, Abdullah, Ramayah, & Mutahar Ahmed, 2017). Future research should be conducted to investigate the relationship between variables by conducting cross-cultural studies as recommended by previous studies (Isaac, Abdullah, Ramayah, & Mutahar, 2017a; Isaac, Abdullah, Ramayah, & Mutahar, 2017b; Isaac, Masoud, Samad, & Abdullah, 2016).

7. Conclusion

Organizations should increase spending on research and development in order to increase the organizational effectiveness (Osama Isaac, Abdullah, Ramayah, Mutahar, & Alrajawy, 2018; Osama Isaac, Abdullah, Ramayah, & Mutahar, 2018; Alrajawy, Mohd Daud, Isaac, & Mutahar, 2016). This study has investigated the effect of transformational leadership and organizational innovation by investigating the relationship between these two variables in Sana'a University in Yemen. Based on the findings in relation to this specific objective, the conclusion reached is that transformational leadership does have a significant and positive impact on organizational innovation. The results were largely consistent with those produced by past researchers who indicated the importance of transformational leadership for addressing followers' needs and promoting intra-organizational innovation. Transformational leaders have also been long-thought to increase organizational innovation by challenging their followers to achieve specifically designed goals and giving them the confidence to achieve them. Moreover, transformational leaders encourage others to build on their personal ability and organizational skills to pursue more innovation.

The literature on organizational innovation and transformational leadership directly supports the intent and primary focus of the current study, namely to measure the relationship between transformational leadership and innovation within an organization. It was hypothesized that transformational leadership would have a significant effect on organizational innovation and that the role of transformational leadership would result in an improvement in organizational innovation (Khan, Rehman, & Fatima, 2009). Many researchers (B. Avolio & Bass, 1991; Lowe, Kroeck, & Sivasubramaniam, 1996; Stevens, D'Intino, & Victor, 1995) have consistently reported the characteristics of transformational leadership as being more effective, productive and innovative. They indicate that transformational leadership has its own impact on organizational innovation. The research also found that by adopting a transformational leadership style, Sana'a University has seen a significant effect on its organizational innovation. This bears out the claim by various scholars, who state that significant impact can be made at the individual, group or organizational level and achieve better results through transforming the behavior of their leaders (Wang, Oh, Courtright, & Colbert, 2011).

Appendix

Appendix A

Instrument for varibles

Varible	Measure	Rating Scale	Source
Transformational leadership (TL)	Idealized Influence (Attributed) (IIA): 1) I instill pride in others for being associated with me. 2) I go beyond self-interest for the good of the group. 3) I act in ways that build others' respect for me. 4) I display a sense of power and confidence. Idealized Influence (Behavior) (IIB): 1) I talk about my most important values and beliefs. 2) I specify the importance of having a strong sense of purpose. 3) I consider the moral and ethical consequences of decisions. 4) I emphasize the importance of having a collective sense of mission. Inspirational Motivation (IM): 1) I talk optimistically about the future. 2) I talk enthusiastically about what needs to be accomplished. 3) I articulate a compelling vision of the future. 4) I express confidence that goals will be achieved. Intellectual Stimulation (IS): 1) I re-examine critical assumptions to question whether they are appropriate. 2) I seek differing perspectives when solving problems. 3) I get others to look at problems from many different angles. 4) I suggest new ways of looking at how to complete assignments. Individualized Consideration (IC): 1) I seek differing perspectives when solving problems. 2) I treat others as individuals rather than just as a member of a group. 3) I consider an individual as having different needs, abilities, and aspirations from others. 4) I help others to develop their strengths.	5-point Likert scale: (1) Strongly disagree to (5) Strongly agree	(Avolio & Bass, 2004)
Organizational Innovation (OI)	Product Innovation (PTI): 1) In my institution, new technology is adapted for improving the work processes (computers, wireless networking etc.) 2) In my institution, we try new methods for improving processes (paperless environment, web casts for delivering lectures etc.) 3) My institution is quick to respond to changing needs of its customer (students) Process Innovation (PSI): 1) We always develop new product (degree/certificate/diploma programs) 2) We try to introduce and diversify our product (degree programs) to suit customer needs 3) We try to specialize in certain degree programs that are in demand in the market 4) We always try applying new idea/technology at our institution. Administrative Innovation (AI): 1) In our institution there is participative working environment 2) Administrative support is always there for faculty 3) Employees compensation system is linked to performance 4) Our institution has a new and improved performance evaluation system 5) At our institution, we believe in open communication environment 6) In our institution, employees are hired on their creativity	5-point Likert scale: (1) Strongly disagree to (5) Strongly agree	(Tsai et al., 2008)

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