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The impact of Transformational and Authentic leadership on innovation in higher education: The contingent role of knowledge sharing

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ABSTRACT

The aim of this study is to investigate the effect of two leadership styles – Transformational and Authentic leadership on process and product innovation in higher education institutions in Jordan. We also examine how the effect of these leadership styles fluctuates based on the extent to which knowledge sharing is prevailing norm in an institution. We examine our suggested model in higher education institutions in the north of Jordan and utilize structural equation modeling (SEM) techniques for data analysis. Findings reveal that Transformational leadership and Knowledge sharing have a positive impact on the innovativeness of higher education institutions in Jordan. On the other hand, Authentic leadership does not show any support for innovativeness in the higher education sector in a non-western country like Jordan. In addition, knowledge sharing norms significantly moderate the effect of Transformational leadership but exhibited no moderating influence on the effect of Authentic leadership.

1. Introduction

The higher education sector is plagued by numerous amount of challenges including technological development and political issues as well as novel and non-traditional demands on education sectors worldwide, all of which make the higher education sector an attractive area for research (Mathew, 2010). With increased pressure from globalization, changing funding structures in higher education, and changing supply of and demand for higher education, many higher education institutions around the world strive for survival and seek for competitive advantages through innovations (Brown, 2008; OECD, 2009; Brennan, 2008; Gibbs and Barnett, 2014; Gaspar and Mabic, 2015). Factors affecting innovation in higher education institutions have thus always represented a vital area of concern in the field of organizational studies (Meek et al., 2009). Typically, extant literature is of the general position that successful innovative practices in organizations build on the interplay among several individual and institutional factors (Hoidn and Kärkkäinen, 2014; Silver, 1999; Zhu, 2015).

In particular, prior research on higher education has highlighted the prominent role played by both leadership and knowledge sharing practices (Li et al., 2014; von Krogh et al., 2012). Proper leadership has the potential to promote organizational innovation by motivating employees and fostering a conducive atmosphere for the development of their creative and innovative skills which

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eventually lead to enhanced innovation capabilities and superior competitive advantages for the organization (Li et al., 2014; Srivastava et al., 2006; Xue et al., 2011; Yang, 2007). Despite the variety of theories debating what the proper leadership style for noticeable innovations in an organization should be, prior research has emphasized the importance of Transformational leadership (TL) to do so (Lin, 2014; Masa'deh et al., 2016; Rawung et al., 2015b). Transformational Leadership styles focus on teamwork, motivation and collaboration with employees at different levels to ascertain the desired change in an organization (Bass and Riggio, 2006; Leithwood and Sleegers, 2006). Transformational leaders set objectives and incentives to drive their subordinates to higher performance levels while maintaining opportunities for professional and personal growth for each employee (Bass and Avolio, 2013; Gumusluoglu and Ilsev, 2009). While innovations require significant changes in an organization, TL styles appear to be the most effective style for promoting innovations in many organizations (Gumusluoglu and Ilsev, 2009; Howell and Avolio, 1993; Khalili, 2016; Nijstad et al., 2014). Along with TL, knowledge-sharing practices have a major effect on an organization's innovative capabilities (Lin, 2007; Ritala et al., 2015; Wang and Wang, 2012). Obviously, innovation and creativity themselves are the outcomes of information and knowledge that are available about a given area of focus (Lee et al., 2015; Ritala et al., 2015). Therefore, sharing and exchanging information among employees would increase innovation and creativity in an organization.

However, while prior research has advanced our knowledge of the factors affecting innovation in higher education institutions, it is important to highlight several noteworthy gaps in the literature before reaching any solid conclusions. First of all, most studies within prior research limit the effective leadership styles to TL neglecting new approaches to leadership (Al-Husseini and Elbeltagi, 2016). Recently, Authentic leadership (AL) has received considerable attention among leadership scholars who claim that it is highly beneficial to organizations and lead to desirable outcomes (Luthans et al., 2006; Walumbwa et al., 2008). Authentic Leadership approach suggests that leaders build their legitimacy on ethical foundations, respect, and honest relationships with their followers. Normally, AL promotes openness and encourages building trust between leaders and subordinates, which are highly necessary for innovation and creativity (Walumbwa et al., 2008). While its influence on innovation seems feasible, AL receives little attention in prior research, particular within the higher education literature. Secondly, prior research has overlooked the interaction and the interplay between leadership styles and knowledge sharing. It has been suggested that an effective leadership is contingent upon the characteristics of subordinates and the context under which leadership styles operate (Gardner et al., 2011). Knowledge sharing exists in organizations in the form of embedded culture and norms that may facilitate the efforts of transformational and authentic leaders towards achieving strategic changes, outcomes, and innovations.

In this research paper, we contribute to the existing literature by clarifying the aforementioned voids. We do so as follows. First, we suggest the effect of Authentic Leadership alongside Transformational Leadership on innovation in higher education. This would provide new insight into several approaches for effective leadership that are deemed important for innovation in higher education. Second, we introduce the interaction effect between the two styles of leadership and knowledge sharing. This would reveal hitherto unknown relationships which should provide for actionable reference points for both practitioners and academicians.

2. Background and hypotheses development

In recent decades, both creativity and innovation have become serious skills for achieving success in developing and developed economies. Innovation also has been recognized as a sure path to increase the productivity of organizations and increase economic development. At the aggregate level, innovation is a product of the national innovation systems which comprises a set of participating actors (government, regulatory firms, research institutes, universities, financial institutions bodies, etc.), their activities and their interaction. Innovation in higher education institutions plays a vital role and contributes significantly to the innovation of all subsystems in a country. Higher education institutions are a vital zone for the production, dissemination and transfer of economically productive knowledge, technology and innovation in today's knowledge economy (Naidoo, 2010). As higher education institutions are in close connection to other institutional spheres, such as businesses, industry, government and non-government agencies, innovation at higher education institutions can affect all aspects of innovation in a society at large. Innovation in higher education can be obviously manifested in the central functions of higher education as offering education and undertaking research which include the entire spectrum of activities directed to knowledge creation, transmission and transfer. Innovation in higher education institutions refers to their ability to produce and implement a new or provocatively enhanced process, product, or organizational method which has a considerable effect on the activities of a higher education institution and or its stakeholders such as students, communities and firms (Brennan et al., 2014).

With increased challenges facing higher education institution globally including increased pressures from globalization, lack of funds, and the demand and supply fluctuation for higher education services, many higher education institutions around the world strive for survival and seek for competitive advantages through innovations (Brown, 2008; OECD, 2009; Brennan, 2008; Gibbs and Barnett, 2014; Gaspar and Mabic, 2015). As innovation becomes vital to the wellbeing of a country and to the survival of higher education institutions, prior research has identified several individual and institutional factors affecting innovations in higher education institutions including leadership styles and knowledge sharing (Hoidn and Kärkkäinen, 2014; Silver, 1999; Zhu, 2015). Leadership styles has been recognized as one of the most important aspects affecting innovations since leaders effectively play prominent role in ideas production, goals setting, and creation a culture for innovation.

In the middle of 1970, Burns (1978) developed the notion of transformational-transactional leadership theories to describe political leaders. Bass (1985) classifies and distinguishes these two types including transactional and TL. He suggests that leaders following the transactional style commonly consider how to marginally maintain and improve the quality and quantity of performance, how to decrease resistance to change, how to substitute one goal for another, and how to implement decisions. Meanwhile, leaders following the transformational style mostly attempt to achieve goals and implement changes by successfully raising

subordinates to a greater level of awareness about the issues of consequence. Transformational leaders can upraise and enlarge the interests of their employees, change the perceptions, expectations, and motivations of their employees to work towards common goals and to look beyond their own self-interest for the good of the group.

According to Avolio et al. (1991) and Avolio and Bass (2002), four behavioral components determine the ability of transformational leaders to inspire their followers. The first is Inspirational Motivation which refers to the efforts that the leader puts into articulating a vision that inspires and appeals to employees about future goals that give meaning to the current tasks (Warrilow, 2012). According to Bass and Riggio (2006) leaders who have inspirational motivation could enhance the follower's self-efficacy, motivation, innovation. The second is Charisma, also known as Idealized Influence, which refers to the degree to which a leader exhibits commendable behavior and principles causing followers to identify with them as role models and influential members of society (Gumusluoglu and Ilsev, 2009). Leaders give priority to the needs of their followers, share knowledge and expertise with them, using communication skills rather than power (DuBrin, 2007; Yukl, 2013). The third is Intellectual Stimulation which indicates the capacity within which a leader encourages and stimulates creativity and contests assumptions in the employees by providing them with a framework to help them overcome the challenges they encounter at work (Özaralli, 2003). In this approach, leaders try to motivate their followers to take up new challenges by testing new ways of doing things, promoting ideas and innovation. Such leaders try to challenge traditional values, and beliefs and encourage their followers to support new approaches (Jung et al., 2003). Finally, Personal Attention is the fourth mechanism which is also known as individualized consideration. It defines the charisma with which a leader attends to the individual interests of their employees and poses as a mentor to each follower (Alnajdawi et al., 2017; Osborn and Marion, 2009). It requires a great deal of respect and appreciation from both parties but needs the leader to acknowledge the employee's contribution to the team a lot more if they want to inspire further growth and developmental activities from the employees.

However, the significance and importance of TL comes from its role in enhancing organizational productivity and innovation. It had been shown in several empirical works that organizations which apply transformational styles of leadership are more productive at different levels (i.e. individual, team, unit, or firm) (Barrick et al., 2015). Also, it was found that organizations which apply TL perform better even if it is applied in the presence of in-role tasks, extra-role activities, or innovation (Keller, 1992). Moreover, Transformational leadership and its behaviors can build a climate of trust that fosters innovation across the entire breadth of the organization (Al-Husseini and Elbeltagi, 2016; al-Husseini, 2014). Vaccaro and his collgues (2012) and Alzawahreh (2011) found that TL styles have the ability to change organizational culture and encourages process and product innovation, while enhancing the creativity of employees. In this article, we extend current endeavors by examining the effect of TL on innovation in Jordanian universities and we hypothesize the following:

H1. TL will positively influence innovation in private universities in Jordan.

In the current turbulent work environment, ethical and performance issues have called for a new ethical approach to leadership (Avolio and Gardner, 2005). Both practitioners and academics have highlighted the significance of Authentic Leadership (AL) to do so. Walumbwa et al. (2008) define AL as "a pattern of leader behavior that draws upon and promotes both positive psychological capacities and a positive ethical climate, to foster greater self-awareness, an internalized moral perspective, balanced processing of information, and relational transparency on the part of leaders working with followers, fostering positive self-development." Avolio and Gardner (2005) suggested that the behavior of authentic leaders can enhance followers' performance outcomes which are sustainable even in unstable work environments.

AL has four behavioral dimensions. As suggested by Walumbwa et al. (2007), those are Self-awareness, relational transparency, moral perspective and balanced processing. Self-awareness can be defined as the extent to which a leader is conscious of his or her limitations and strengths and how these can impact others. Social psychologists operationalize and define authenticity as moral development at the advanced level (Walumbwa et al., 2007). Authentic leaders care about and point out moral issues and are guided by moral values and standards, societal groups and organizational pressures (Peus et al., 2012). Another component identified in AL is relational transparency which basically is showing one's ingenuity. According to Avolio and Gardner (2005)), it indicates achieving and valuing truthfulness and openness in one's intimate relationships. Balanced processing is the last component of AL and reflects impartial decision-making process.

Prior research has found that AL has the potential to raise followers' performance, organizational citizenship behaviors, follower feelings of empowerment, and followers identification with the leaders or organization, (Leroy et al., 2012; Walumbwa et al., 2010). Moreover, AL also positively affects group performance, group positive psychological capital, teamwork, group trust, team positive affective tone, and team authenticity Hannah et al. (2011), and Hmieleski et al. (2011). While AL entails an environment that is critical for innovation, limited research has examined its role in innovation, particularly at higher education institutions. Cerne et al. (2013) suggest that innovative cultures have a few aspects that give authentic leaders the opportunity to influence the organization's innovation strategy. Many managers fail to realize that a strong and authentic leader who values and engenders trust provides a key to developing an organization's trust culture (George et al., 2007; Avolio and Gardner, 2005) argues that authentic leaders transfer their mission and vision to their collaborators with significance that empowers them to grow a sense of drive and determination in the duties they undertake. Authentic leaders exhibit calmness and tolerance, which are vital features in situational control that make AL effective in innovation (Yaverbaum and Sherman, 2008). According to Zhou et al. (2014) the higher the AL the higher the employee innovation. Moreover, AL plays a crucial role in employee's creativity and innovation (Gong et al., 2009, Rego et al., 2012, 2014) and positively influences employees new ideas development which leads to creativity and innovation (Malik et al., 2016). According to Reiter-Palmon and Illies (2004), AL may change the perspective of employees motivating them to come up with solutions and new ideas. Accordingly, we posit that:

H2. AL will positively influence the innovation in private universities in Jordan.

Along with leadership styles, knowledge-sharing practices have a major effect on an organization's innovation (Wang and Wang, 2012). Knowledge sharing is a set of behaviors that involve the exchange of information, sharing, and donating task-relevant ideas, information, and suggestions between employees and team members (Lin, 2007; Elrehail et al., 2016, 2013). Typically, innovations in an organization are likely to rely heavily on employees' knowledge, experience, and skill, in the value creation process (Ritala et al., 2015). Knowledge sharing is a valuable mechanism for innovation (Mura et al., 2013). To complete innovative tasks in an organization, employees continuously need to benefit from tacit knowledge (skills or experience) held by their colleagues or utilize explicit knowledge existing in the organization (Jantunen et al., 2008). Accordingly, an organization that can encourage shared knowledge practices among employees, groups, and within the organization as a whole is expected to produce new ideas and thoughts that are useful for developing new business opportunities (Lundvall and Nielsen, 2007; Michael and Nawaz, 2008). In turn, on-going knowledge sharing is an integral part of an organization's learning activities and problem-solving and it was linked to learning and market orientations leading to improvements in market sensing and innovation activities (Lin, 2007; Alzghoul et al., 2016). Moreover, prior research points that on-going shared knowledge in an organization would yield faster responses to customer needs and requirements at a lower cost in operations and it would facilitate a wide range of changes to the organization (Calantone et al., 2002; Law and Ngai, 2008; Vaccaro et al., 2012). Thus it is obvious that knowledge sharing practices play a vital role in the promotion of innovation. This lead us to the following hypothesis:

H3. Knowledge sharing will positively influence the innovation in the private universities in Jordan.

Along with its direct effect, knowledge sharing can be seen as a facilitating condition to the role of the leadership (Bradshaw et al., 2015). We argue that knowledge sharing may be the critical key that managers can use to direct the course of their firms (Han et al., 2016). In a context where knowledge sharing is prevailing norms in a firm, there are more opportunities for leaders to receive more solutions, opinions, suggestions, ideas and information from employees when the leaders engage in participative decision making (Rawung et al., 2015a). Under such condition, the odds are higher that the leader will arrive at the right decision and the best solution. Leaders with transformational and authentic behaviors are also better able to solve problems and achieve changes when organizational members experience a high degree of knowledge sharing (Loebbecke et al., 2016). Thus, for all the above reasons, it is quite likely that an empowering leader will be more innovative when knowledge sharing is the prevailing norm in a firm. Accordingly, we hypothesis as the following:

H4. Knowledge sharing will moderate the relationship between the TL and innovation in the private universities in Jordan.

H5. Knowledge sharing will moderate the relationship between AL and innovation in the private universities in Jordan.

Fig.1. represents the suggested model

3. Methodology

This study is quantitative in its nature investigating several relationships among independent and dependent variables (Bryman and Bell, 2007; Saunders et al., 2012). We develop a structured questionnaire to collect data about each variable included in the suggested framework. We adopt well-developed items from prior research to measure suggested variables in this study (the sources

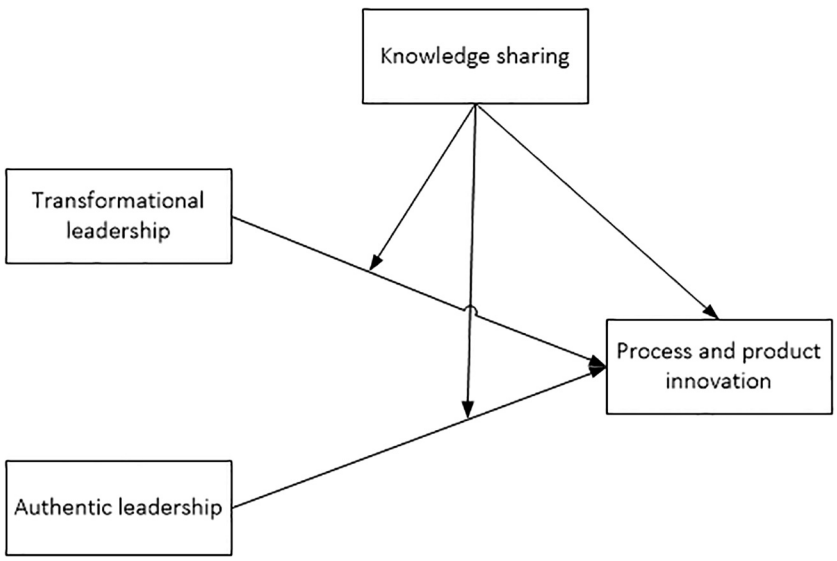

Fig. 1. The proposed research model.

are described below). The main respondents for this study were academic staff. Our population was all academic staff employed in private universities in the north of Jordan. The main ream for selecting academic staff is that they represent the single most important source of innovation in universities and the main producer of innovation in the higher education sector. As mentioned by prior research many research papers and reports agree that private HEI ability to innovate is greater than public HEI (Brennan et al., 2014; Hegde, 2005; Koko Etuk and Etuk, 2015; Resnick, 2012), following this recommendation the authors applied this study in HEI. Four private universities are available in the north of Jordan. As reported by the researchers, the whole number of academic staff in the four universities is 487. As recommended by previous studies if the population is too small the researchers should try to cover the entire population. Accordingly, we distributed 407 questionnaires for the four universities and the returned questionnaires were 234. We excluded all incomplete responses and those that suffer from extensive missing values (Hair et al., 2010). The number of the valid responses was 173.

4. Items measurement

- *Transformational Leadership (TL):* we adopted seventeen questions (i.e. items) developed by Bass (2000) and distributed by MIND GARDN Inc. to examine the TL. For example, “My leader acts in ways that build my respect”, “My leader suggests new ways of looking at how to complete assignments”.
- *Authentic Leadership (AL):* we adopted AL Questionnaire (ALQ) from Neider and Schriesheim (2011) and Walumbwa et al. (2008) which included fourteen questions. as an example, “My leader clearly states what he/she means”.
- *Innovation:* we employed two constructs to measure innovation namely: product and process innovations. We adopted items for each construct from validated and reliable instruments used in extant research (Perri, 1993; Daft, 1978; Škerlavaj et al., 2010). The number of question used is eleven; four for product innovation like “Our university often develops new programs/ services for members of staff and students”, and seven for process innovation for example, “Our university is developing new training programs for staff members”.
- *Knowledge Sharing:* Knowledge Sharing is operationalized as a second-order construct derived from two constructs including knowledge collecting like “Colleagues within my department share knowledge with me when I ask them about it”, and knowledge donating for example “I share information about administrative issues with my colleagues in the University”. Items for each construct is adopted from several previous research (Van den Hooff et al., 2003; van den Hooff and de Leeuw van Weenen, 2004; van den Hooff and de Ridder, 2004; Carmeli et al., 2011).

4.1. Data analysis

This study uses Partial Least Square Structure Equation Modeling (PLS-SEM) for hypotheses testing. While PLS-SEM has recently received many scholarly criticisms such as lack of quality indices and the inability to capture measurement error, it can work efficiently under certain circumstances (Sarstedt et al., 2016). PLS-SEM is a proper technique when the proposed model contains higher-order latent variables (Becker et al., 2012; Hair et al., 2011). It also works efficiently when the model involves several structural path relationships and contains many items per latent variable. Moreover, PLS-SEM is an appropriate technique when the proposed model is complex containing moderating variables and involving many latent variables (Alsaad et al., 2017; Fassott, 2010; Hair et al., 2014a, 2011). It is worthy to mention that PLS-SEM is an alternative choice when the collected data does not meet the data analysis assumptions such as normality and sample size (Hair et al., 2014a,b; Henseler et al., 2009). Armed with the above reasons, this study employed the PLS-SEM approach, in preference over other approaches, for analysing the data. This is because one of the objectives of this study is to explore new relationships wherein the theoretical foundation is less pronounced. Moreover, the relationships between the variables in this study were established at a higher level of abstraction (second-order construct). In addition, the proposed framework contains a moderating variable which increases the complexity of the framework. Finally, the sample size in this study was 173 which is less than the cutoff value required to use other approaches.

The demographic characteristics of the respondents included in this study are presented in Table 1. As shown in the table, the majority of the responses were obtained from males, which accounted for 80.3% of the sample. This value is reasonable as masculinity dominates most aspects of life in the Jordanian context. The table also shows that approximately 82% of the respondents are married. The distribution of the majority of the respondents was in the age range of between 30 and 59 years old. More precisely, the age category of 30–39 and 40–90 years old accounted for roughly 20%. Meanwhile, 36% of the respondents were in the age range between 30 and 39. With regards to the respondents' experiences, about 60% of the respondents possess 10 or fewer years of experience. This may be due to the high percent of turnover in the private higher education sector in Jordan. However, the majority of the respondents are Ph.D. holders which account for roughly 80% of the respondents. A quite high percent of responses came from assistant and associate professors, accounting for 45% and 30% of the sample respectively. Finally, most of the respondents were from two universities, including Jerash and Ajloun universities. Those two universities accounted for about 54% and 22% of the responses. However, this descriptive information suggests that most of the respondents had enough experience and knowledge to take part in the survey and to offer reliable data concerning the constructs under study.

Prior to the conduct and examination of the regression analysis, we examined the distribution of the data by examining SKEWNESS and KURTOSIS for each variable included in the framework. All values varied between the values of ± 0.032. and ± 1.62, which are obviously below the cutoff value of ± 2 (George, 2011). This indicates that our data set is normally distributed.

We also examined the reliability and validity of the first-order measurement model employed in this study. Table 2 shows the item loadings, the Cronbach’s alpha and the composite reliability scores which are used to assess indicator reliability and internal

Table 1
The demographics information of the respondents.

Demographics characteristics			Frequency	Percent
Gender	Male		139	80.3
	Female		34	19.7
Total			173	100.0
Marital Status		Single	25	14.5
		Married	142	82.1
		Divorced	5	2.9
		Widowed	1	0.6
Total			173	100.0
Age		Under 30 years	20	11.6
		30–39 years	69	39.9
		40–49 years	35	20.2
		50–59 years	39	22.5
		60 years and above	10	5.8
Total			173	100.0
Experience		10 years or below	104	60.1
		11–15 years	35	20.2
		16–20 years	29	16.8
		21–25 years	2	1.2
		More than 25 years	3	1.7
Total			173	100.0
Academic Qualifications	Bachelor degree		9	5.2
	High Diploma		3	1.7
	Master degree		23	13.3
	PhD		138	79.8
Total			173	100.0
Academic Position		Assistant Professor	79	45.7
		Lecturer	32	18.5
		Associate Professor	52	30.1
		Professor	10	5.8
Total			173	100.0
University name		Uni 1	39	22.5
		Uni 2	95	54.9
		Uni 3	17	9.8
		Uni 4	22	12.7
Total			173	100.0

consistency reliability. As presented in the table, the loading of all of the items onto their postulated latent variables was appropriately between 0.77 and 0.90, with exception of two items namely: RelTra2 and IdlInflu2. RelTra2 was deleted as it loaded less than 0.4. The second item (IdlInflu2) belongs to Idealized Influence and it loaded approximately 0.68 which is in the range of the acceptable values as suggested by Hair et al. (2014a,b), and thus no further action was taken. The table also indicates that the Cronbach's alpha and the composite reliability scores are obviously above the threshold value of 0.7. We also assess the validity of the measurement model using Average Variance Extracted (AVE). As shown in Table 1, the AVEs were ranging between 0.63 and 0.76 which are well above the threshold of 0.5. Accordingly, the researcher can claim that all latent variables in the model were able to explain more than half of their own items' variance and thus ensure sufficient convergent validity. We also assess the AVE square root in order to ensure the discriminant validity. As shown in Table 2, AVE square root value for each latent variable was greater than its correlation with the other latent variables demonstrating a great deal of discriminant validity. Overall, the figures above provide evidence that the measurement model is reliable and valid. Therefore, it can be concluded that the all constructs are appropriate for further analysis.

Next we examine both the reliability and validity of the second-order latent constructs (Becker et al., 2012; Wetzels et al., 2009). Since the second-order latent variables in this study are operationalized as reflective latent constructs, the researcher examined the loading of each first-order on its postulated second-order latent variable. As shown in Table 3, the loading of all first-order constructs is above the cutoff value of 0.7. Similarly, the value of Cronbach's Alpha and Composite Reliability of each second-order construct is above 0.7. Finally, the values of AVE range between 0.516 and 0.692 which are well above the cutoff value of 0.5. Accordingly, all second-order latent variables in the model are reliable and valid. Having such qualities, the research can safely move toward testing the quality of the structural model and testing the proposed hypotheses.

We established two structural models to examine our hypotheses including the main effect model and the interaction model. The main effect model was designed to examine and test the hypotheses from H1 to H3. Meanwhile, the interaction model was proposed to examine the hypotheses related to the suggested moderation effects in H4 and H5. These actions were taken in accordance with a recommendation from Hair et al. (2014a), who emphasis that the relationships between variables may largely differ when the

Table 2
the reliability and validity of items and constructs.

The variables	The variables' dimension	Cronbach's Alpha	Composite reliability	AVE	Items	Items loading
TL	Idealized influence	0.847	0.897	0.634	IdInflu1	0.841
					IdInflu2	0.685
					IdInflu3	0.815
					IdInflu4	0.798
					IdInflu5	0.832
	Individualized consideration	0.854	0.896	0.686	IndCon1	0.804
					IndCon2	0.869
					IndCon3	0.859
					IndCon4	0.777
	Inspirational motivation	0.851	0.899	0.69	InspM1	0.846
					InspM2	0.813
					InspM3	0.856
					InspM4	0.808
	Intellectual stimulation	0.845	0.896	0.683	IntStm1	0.776
					IntStm2	0.837
					IntStm3	0.857
					IntStm4	0.834
Authenticate Leadership	Relational Transparency	0.796	0.88	0.71	RelTra1	0.863
					RelTra3	0.829
					RelTra4	0.836
	Self-Awareness	0.812	0.889	0.727	SefAw1	0.846
					SefAw2	0.863
					SefAw3	0.849
	Balanced Processing	0.868	0.91	0.716	BalPro1	0.843
					BalPro2	0.851
					BalPro3	0.865
					BalPro4	0.826
	Internalized Moral Perspective	0.847	0.908	0.766	IntMor1	0.874
					IntMor2	0.881
					IntMor3	0.87
Knowledge Sharing	Knowledge collecting	0.851	0.9	0.692	KnC1	0.839
					KnC2	0.855
					KnC3	0.847
					KnC4	0.786
	Knowledge Donating	0.831	0.887	0.664	KnD1	0.793
					KnD2	0.787
					KnD3	0.856
					KnD4	0.821
Innovation	Product innovation	0.92	0.936	0.676	PrdIno1	0.815
					PrdIno2	0.857
					PrdIno3	0.909
					PrdIno4	0.796
	Process innovation	0.866	0.909	0.715	ProIno1	0.776
					ProIno2	0.827
					ProIno3	0.833
					ProIno4	0.778
					ProIno5	0.828
					ProIno6	0.879
					ProIno7	0.833

structural model contains a moderator (Hair et al., 2014a). We estimated the path coefficients and their significance level in the proposed model using PLS algorithm and the PLS bootstrapping procedures using 500 resample. The results of the estimation of both models are presented in Tables 5 and 6.

Table 4 show that the relationship between TL and innovation was positive and significant ($\beta = 0.248$; $p < 0.05$), indicating that as the TL increases, innovations will increase too. Accordingly, the researcher decides to accept the Hypothesis 1. With regard to the role of Authenticate Leadership on innovations, the relationship was positive and insignificant ($\beta = 0.183$; $p > 0.05$), indicating that Authenticate Leadership has no effect on innovations at significance level 0.05, thereby the researcher decided to reject Hypothesis 2. Finally, the relationship between Knowledge Sharing and Innovation is positive and significant ($\beta = 0.222$; $p < 0.05$), showing that as the Knowledge Sharing increases; innovations will increase too, which give support to accept Hypothesis 3.

Table 5 shows the result of the interaction model. As shown in the table, the interaction latent variable "TL × Knowledge sharing" has a significant path coefficient ($\beta = 0.359$, at $P < 0.05$), indicating that Knowledge Sharing has a moderating effect on the role of TL. Accordingly, the researcher decides to accept H4. This would show that TL is a more efficient practice when Knowledge Sharing is prevailing behavior in private higher education. Fig. 2 shows the relationship between TL and innovations under high and low levels

Table 3
AVE Square Root.

	BP	IdI	IC	IM	IMP	IS	KC	KD	ProcI	ProdIn	RT	SW
Balanced Processing (BP)	0.846											
Idealized influence(IdI)	0.756	0.796										
Individualized consideration(IC)	0.732	0.719	0.828									
Inspirational motivation (IM)	0.636	0.666	0.555	0.831								
Intellectual stimulation (IS)	0.75	0.771	0.725	0.703	0.827							
Internalized Moral Perspective (IMP)	0.713	0.713	0.641	0.666	0.662	0.875						
Knowledge Donation (KD)	0.406	0.484	0.387	0.517	0.507	0.389	0.815					
Knowledge Collection (KC)	0.465	0.478	0.372	0.548	0.47	0.407	0.564	0.832				
Process Innovation (ProcI)	0.594	0.492	0.537	0.375	0.541	0.331	0.37	0.453	0.845			
Product Innovation (ProdI)	0.473	0.455	0.44	0.263	0.472	0.304	0.346	0.409	0.72	0.822		
Relational Transparency (RT)	0.74	0.685	0.665	0.567	0.683	0.675	0.465	0.418	0.507	0.429	0.843	
Self-Awareness(SW)	0.685	0.654	0.577	0.561	0.626	0.624	0.523	0.479	0.463	0.33	0.634	0.852

Table 4
Hierarchical measurement model assessment.

Second-order construct	Cronbach's Alpha	Composite Reliability	AVE	First-order construct	Loading
TL	0.94	0.947	0.516	Idealized influence	0.911
				Individualized consideration	0.854
				Inspirational motivation	0.823
				Intellectual stimulation	0.913
AL	0.933	0.942	0.556	Relational Transparency	0.869
				Self-Awareness	0.832
				Balanced Processing	0.919
				Internalized Moral Perspective	0.859
Knowledge Sharing	0.872	0.9	0.53	Knowledge collecting	0.893
				Knowledge Donating	0.975
Innovation	0.933	0.943	0.6	Product innovation	0.959
				Process innovation	0.888

Table 5
Path Coefficients and Significant Level of the main model.

Variables name	β		T-Statistics	P-Values
Authenticate Leadership	0.183	0.126	1.58	0.057*
Knowledge Sharing	0.222	0.107	2.079	0.012**
TL	0.248	0.155	1.97	0.036**

Significant at * $p < 0.1$ ** $p < 0.05$ *** $P < 0.01$ (one-tailed test).

Table 6
Path Coefficients and Significant Level of the interaction model.

	β	Standard Deviation (	T Statistics (|O/STDEV|)	P Values
Authinticate Leadership	0.134	0.106	1.265	0.103
Knowledge Sharing	0.274	0.101	2.718	0.003
Transformational Leadership	0.339	0.140	2.424	0.008
AL × Knowledge sharing	-0.277	0.196	1.411	0.079
TL × Knowledge sharing	0.359	0.195	1.841	0.033

Significant at * $p < 0.1$ ** $p < 0.05$ *** $P < 0.01$ (one-tailed test).

of Knowledge sharing. This result implies that, with respect to average levels of Knowledge sharing and TL, TL coupled with Knowledge sharing exerts joint positive effects on innovations. That meant that TL was more predictive of innovation as Knowledge sharing became stronger. The result also show that the interaction latent variable "AL × Knowledge sharing" has an insignificant effect ($\beta = -0.227$, at $P > 0.05$), indicating that Knowledge Sharing has no moderation effect on the role of AL. Thus, the researcher makes a decision to reject H5. In view of the above results, the claim that Knowledge Sharing has a moderating effect was partially supported.

In summary, our results showed that only Transformational Leadership and Knowledge sharing have direct effects on innovation

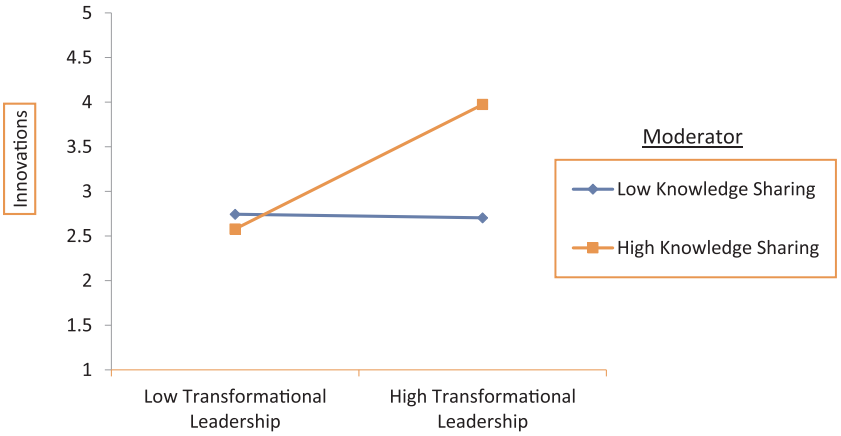

Fig. 2. The Interaction Term between Knowledge Sharing and TL on Innovations.

in the private higher education sector in Jordan. Contrary to expectations, Authentic Leadership has no effect on innovation in the private higher education sector in Jordan. Moreover, the result shows that knowledge sharing interacts significantly with Transformational Leadership and thus the claim that Knowledge Sharing has a moderating effect was partially supported.

5. Discussion

Our study aimed at investigating the effect of two leadership styles namely; Transformational Leadership and Authentic Leadership on process and product innovation. The study also was designed to investigate the moderating role of knowledge sharing on the role of leadership styles suggested in this study. Our study targeted academic staff in higher education institutions in the north of Jordan. 173 valid observations were subjected to regression analysis. We utilized PLS-SEM to examine the proposed hypotheses. We ran two models including a main effect model and interaction model. The results of our main effect model suggest that Transformational Leadership was found to be positively related to process and product innovation in private universities in Jordan. While the role of Transformational Leadership was distinguishably examined at the hierarchal level, the results of this study are consistent with prior study conducted in the higher education sector in a country of close proximity to Jordan namely Iraq (Al-Husseini and Elbeltagi, 2016). This would suggest that transformational leaders and their behaviors can build a climate of trust that fosters innovation as founded in prior research (Al-Husseini and Elbeltagi, 2016; Al-Husseini, 2014). Similar to Vaccaro et al. (2012) and Alzawahreh (2011), our study shows that TL has a positive impact on employee's creativity and has the ability to change the organizational culture and encourage both process and product innovation.

The effect of Authentic Leadership on process and product innovation was also examined in this study. Contrary to expectations, the results obtained from the supplementary analysis show that AL has no effect on process and product innovation in the higher education sector in Jordan. While this result is inconsistent with previous literature including those studies that emphasize the positive link between AL and innovation (Malik et al., 2016; Edú-Valsania et al., 2016), two reasons, at least, could explain our conflicting result. First, AL is a new trend and style in leadership which is weakly understood and implemented, thus the leaders of the higher education sector may need to undergo training about Authentic Leadership and all of its related practices. Future research may investigate how experience could affect the ability of leaders to apply successfully a certain leadership style. Second, private higher education in Jordan had several crises in recent years and there were many unethical practices conducted by a lot of managers and administrative officers in private higher education institutions which affects the ability of members of the academic staff to innovate. Such issues may be responsible for the unproductive nature of existing Authentic Leadership behaviors where present.

Finally, in our main effect model, we examined the direct effect of Knowledge sharing norms on innovation. Unlike prior research, we operationalized knowledge sharing as a reflective construct measured by knowledge donating and collecting norms rather than as explicit knowledge and tacit knowledge. This was in order to maintain consistency with the research objective which assumes that knowledge sharing practices and norms including knowledge donating and collecting would facilitate innovation in higher education institutions. Our results indicate that knowledge sharing is positively associated with process and product innovation in the context of private universities in Jordan. This result shows consistency with prior research (Al-Shaima et al., 2016; Al-Husseini, 2014; Al-Husseini and Elbeltagi, 2016; Lin, 2007).

However, we estimated the interaction model to examine our moderating hypotheses. Our results show that the interaction effect of knowledge sharing is positively related to TL and innovation in higher education sector. This would suggest that knowledge sharing can be seen as a facilitating condition to the role of transformational leadership. Furthermore, knowledge sharing is a critical key that managers can use to direct their firms toward innovation. Contrary to expectations, the moderate role of knowledge sharing between AL and Innovation was not confirmed. This suggests that the effect of AL style on innovation depends on ability of leader to both create positive psychological capacities and a positive ethical climate in an organization than on the prevailing knowledge sharing practices and norms.

6. Theoretical and practical implication

This study was designed to examine the impact of leadership styles (i.e. Transformational and Authentic Leadership) on innovation (i.e. Process and Product innovation) and to examine the moderating role of Knowledge Sharing on the role of the two leadership styles in private universities in Jordan. By doing so, this study fills critical voids in the literature. First, while prior research limits the effective leadership styles to Transformational Leadership (TL) neglecting new approaches to leadership, this study is among early studies that investigates the effect of Authentic Leadership (AL) on process and product innovation in higher education in one theoretical framework which enriches the AL theory with new knowledge from this aspect and gives a new dimension in the higher education literature. Furthermore, our operationalization of TL is quite different from previous studies. We examined TL as a high-ordered construct instead of studying its behavioral diminutions separately (i.e. First-order construct). This move enables us to theorize and evaluate the influence of the general concept that represent several facets of particular theory, rather than the influence of its dimensions separately (Alsaad et al., 2015). Second, we test our suggested framework in a non-western country like Jordan which significantly differs from those studies conducted in western context. This would further deepen our understanding of innovation, leadership, and knowledge management in contexts which presents a different culture and quite unique characteristics particular to Arab countries. Third, prior research implicitly assumes that leadership styles facilitate innovation in organizations neglecting the role played by the context and the prevailing norms in the organization. Investigating the moderating role of knowledge sharing sheds light on some conditions deemed important in facilitating the role played by leadership in promoting innovation in organizations. Our findings emphasise that knowledge sharing offers opportunities for leaders to receive more solutions, opinions, suggestions, ideas and information from employees when the leaders engage in participative decision making. Chances for leaders to arrive at the right decision and the best solution are higher when knowledge sharing is the prevailing norm in an organization. Leaders will be more efficient in problems solving and achieving organizational changes when organizational members experience a high degree of knowledge sharing. Actually, based on the results of this study we discover that AL has no impact on innovation in higher education from the perspective of private universities in Jordan which necessitates a deeper investigation into this phenomenon and which opens a new direction for future researchers to focus on: AL and innovation in higher education in other countries and sectors.

With regard to practice, this study implies and presents many pieces of advice for leaders in the Jordanian higher education sector, especially those in its private universities. Transformational Leadership and its underlying behaviors is the most proper leadership style which provides a supportive environment for innovation in private universities. Moreover, they should concentrate on knowledge sharing and provide universities with a culture that enhance knowledge sharing among academic staff at the departmental level or within the university as a whole.

7. Limitation of study

Actually, it is difficult to find any study without limitations. Likewise, this study has a couple of limitation as listed below:

- The first limitation of this study is that it was conducted using four universities located in the north of Jordan which limits our ability to generalize the findings of this study. Future research should survey a representative sample to make our result more generalizable nationwide.
- The second limitation of this study, is that it was conducted in a developing country like Jordan, thus, future studies should examine the phenomenon in other universities in developed countries within Asia, Europe, and North America.
- The sample used in this study was from four Private Universities in Jordan, so for that, the results cannot be generalized to other sectors. Future research should test our framework in other sectors to examine its veracity in predicting innovations in other sectors.
- The study focused on only two leadership styles among a host of other styles available in literature. Thus future studies should investigate the relationship between other leadership styles and theories and innovation.

8. Future researches

Although briefly hinted in the preceding section, future research should replicate the same study model various sectors, to see if similar findings will be obtained. Also, more innovation types should be taken into consideration, for instance administrative innovation and organizational innovation. Moreover, future researchers may take learning organization as a mediator or moderator in future studies. Adding other mediating and moderating variables such as training and trust is quite beneficial. For instance, Alsaad et al. (2017) find that trust can largely affect innovation particularly in Arabian counties.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.tele.2017.09.018.

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