Knowledge management and its impact on knowledge sharing adoption in e-learning communites in Saudi Universites

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Abstract

Knowledge sharing is a significant component of success in knowledge management. In most organisations, knowledge management is often lacking when it comes to knowledge sharing adoption, especially between academic staffs who work in Saudi universities. This paper investigates factors affecting knowledge-sharing adoption among academics in Saudi e-learning communities. A model that will affect the process of knowledge sharing within the e-learning community is proposed. Hypotheses have been developed. Data has been collected in Saudi public universities. Partial Least Square approach has been applied to analyse the data. The findings provide key factors affecting knowledge-sharing adoption among academic staff.
Keywords: Knowledge Sharing, E-learning Communities, Saudi Arabia, Partial Least Square.

1.   Introduction

Knowledge Management (KM) is relatively a new research area within the Arab countries generally and Saudi Arabia in particular. Saudi Arabia has given a high priority to transform the Saudi society to knowledge-based-society and consequently to knowledge-based-economy [57]. In the context of this study, Saudi Ministry of Education (MOE) has launched a national Learning Objects Repository (LOR) project called 'Maknaz' which aims to serve the strategic plans towards the enrichments in learning resources and knowledge growth. However, there is a need to populate the Saudi national Learning Objects Repository 'Maknaz' with reusable digitalized contents and learning electronic materials [7] cited in [4]. E-learning communities lack an integrated knowledge management framework that leads to learning contents creation, knowledge management practices and processes in an online learning approach. However, knowledge management techniques in e-learning can offer Saudi e-learning communities with knowledge contents creating, filtering, sharing and reusing.

E-learning communities refer to the educational environments that address the learning needs of its members through computer-mediated communication. Also refers to "computer-supported knowledge-building communities" [55], [19]. In this respect, knowledge is difficult to separate from practice; and practice is inseparable from the communities in which it occurs. Based on these reasons, Saudi universities have started to think through the future role of e-learning in their institutional futures [13]. It has been stated in [31] that there has been rhetoric of using e-learning to support a knowledge-based-economy by proposing broader and different types of access for learning. According to [34], knowledge sharing is the main component of success of many organizations. In particular, academic institutions might be unable to perform well due to their knowledge sharing disabilities. Previous researches have shown the key factors that influence knowledge sharing adoption in various organizational settings [37], [54], [21], [29]. Similar to other organizations, universities as knowledge-based entities tend to rely more on knowledge sharing. However, very little research has investigated the knowledge sharing

adoption of academic staffs in academic institutions, especially in Saudi Arabia in the context of e-learning communities [34], [4,5].

1.1 Research Problem

This paper investigates the different factors that influence the adoption of knowledge sharing activities in Saudi e-learning communities. The research attempts to address the following research question: What are the factors that influence the adoption of knowledge sharing among academic staff in e-learning communities in Saudi Arabia?

2. Literature Review

Knowledge originates within individuals or social systems (groups of individuals) [6]. Previous researchers have classified knowledge management into individual and organisational dimensions [23]. Most frequent studied organizational dimensions for knowledge management are: management leadership and support, information technology infrastructure, incentives and rewards [65], [9]. Most frequently discussed factors in individual dimensions are: trust, and people-self motivation [16], [24]. The literature reveals that the availability of several different knowledge management factors and the richness of these factors influence the effectiveness of knowledge sharing attitude and behavior. For-example, it is presented in [66] that some of the commonly used factors are trust, and self-motivation. Other factors that affect knowledge sharing in organizations include rewards (which in turn relate to extrinsic motivation), support from the management and the overall environment of the organization.

2.1 Knowledge Management Organisational Factors

A literature review has been carried out to find the knowledge management organizational factors affecting knowledge-sharing adoption. These include leadership support, knowledge sharing process, organizational rewards, IT infrastructure, subjective norms, attitude and behavioural intention. And these factors are reviewed here.

Leadership refers to the functions to create knowledge management initiative efforts [30]. Leadership support is a key function in any knowledge management adoption initiative in organisations [30], [26]. Researchers have confirmed that the adoption of knowledge or experiences sharing practices among staffs is primarily influenced by the degree of top management adoption for the same initiatives [43], [30], [49]. According to [65], leaders' roles are important in developing knowledge management behaviour. This means that staffs are more likely to follow their leaders when they encourage them to share knowledge.

Knowledge-sharing processes refer to the processes of donating and collecting knowledge [49]. Knowledge donation denotes the employee actions to pass on their intellectual capital in an organisation while knowledge collection refers to the employees' action asking for advice from each other in order to build intellectual capital [49]. Knowledge sharing process is a key process among other knowledge management processes such as knowledge creation, transfer, acquisition and dissemination [30]. In various studies, knowledge sharing has been described as the phase that exists between "knowledge creation and knowledge utilisation of knowledge management (KM) activities [52], [1], [59]. Effectual knowledge sharing processes in an organisation allow the knowledge to be socially shared among individuals to create valuable knowledge contents that enhances the production of organizational intellectual property capital and growth [47].

Reward system refers to the incentives for knowledge sharing efforts [62]. Organisational rewards can be used to motivate staff members to coordinate efforts toward achieving organisation aims. Researchers have argued that the rewards encourage employees; employees like to perform their job well when they see the rewards on successful achievement of the activity or task [20], [33]. Hence, one of the important factors is to establish the right incentive, reward or motivational aids to encourage people to share and apply knowledge. Giving incentives to employees help to stimulate and reinforce the positive behaviour and culture needed for effective knowledge sharing [39]. A study conducted by [34] in a Malaysian

university and the results showed that rewards have positive influence on the attitude in knowledge sharing contexts for academics.

Information Technology (IT) infrastructure refers to technologies supporting communication among staff to help in decisions making process. IT is an enabling factor in successful knowledge sharing system. It plays an essential role in knowledge sharing as it raises the level of knowledge sharing adoption. Information Technology is positively associated with the knowledge creation in various ways including the process of knowledge sharing, storing and flow. Based on the solutions offered by information technologies, knowledge management systems are rapidly adopted to create, capture, share and deliver vast volume of knowledge contents within organizations.

2.2 Knowledge Management Individual Factors

Most frequently discussed factors in individual dimensions are: trust and people self-motivation [16], [24]. Knowledge-sharing is a key aspect of knowledge management because it supports the depository codification of available knowledge in an organisation. People self-motivation and trust factors received strong emphasis from the researchers in influencing the success of knowledge-sharing [3]. The organisation leaders set the social norm that sets staff's knowledge-sharing behaviour, and model their behaviour by affecting staff to imitate. In the literature, several different knowledge management factors can influence the effectiveness of knowledge-sharing attitude and behavior. Some of the commonly used factors are trust, and self-motivation [66]. A research by [30] discussed six knowledge management success factors that interact with each other, rather than a random collection of unrelated essentials.

The successful sharing of knowledge requires that the management encourages positive social interaction, trust among the members of teams and thus effective knowledge-sharing [36]. In order to be functional, communities need to develop an atmosphere of trust where the participants dispense their doubts about the willingness of others to work for the benefit of the groups [15]. A concept readily employed in knowledge management literature in relation to self-motivation is the notion of 'self-efficacy'. Self-efficacy refers to a person's belief in his or her own capabilities. In other words, it means how much trust the participants have in their own ability to succeed.

2.3 Subjective Norms

Subjective norm is defined by [2] as the degree of individual's perception that he/she can have on whether people who are important to him/her think about a specific behaviour should be performed or not. It is the degree to which an individual perceives the demands of others on that individual to use an information technology system or to perform a task [63]. Various studies have found positive relationships between individual's attitude and subjective norms [50], [64].

2.4 Attitude and Behavioural Intention

Attitude is a positive or negative feeling that an individual has in order to carry out a specific behaviour [2]. It is described as "the physical tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour [35]. It is argued in [46] that educators' attitude towards accepting and using technology is a key factor that determines the successful acceptance and use of information technology system among educators. According to [63], the educators' attitude is a conditional factor towards the success of any initiative to adopt any technology or system in the educational field. Hence, as educators' attitude considerably influences the process of determining the use of any information technology or system, it is needed to investigate their attitude towards adopting the e-learning system for using it for knowledge sharing practices among academic staffs in the e-learning community in Saudi universities. Researchers define behavioural intention as the strength of the adopter's intention to make or to perform a specific behaviour toward an adoption decision for new technology in the organisation [28]. A research considers the others scholars' view and argues that individual

beliefs and attitudes are the co-determinants of any behavioural intention to adopt any new system or technology [25].

3. Theoretical Background and Hypotheses Development

This research attempts to identify the factors of knowledge sharing adoption in e-learning communities in Saudi Arabia, and proposes a model that will affect the process of knowledge sharing within the e-learning community via applying knowledge management practices. Therefore, the relevant literature on most frequently cited theoretical models on organisational knowledge management factors and attitude and behavioural intention are reviewed. The study deals with widespread models related to attitude and behavioural intentions such as Theory of Reasoned Action (TRA) by [28], Theory of Planned Behaviour (TPB) by [2], [28] and Unified Theory of Acceptance and Use of Technology (UTAUT) model by [64]. When it comes to predicting human behaviour, Theory of Planned Behaviour (TPB) and Theory of Reasoned Action (TRA) are widely discussed. Theories suggest that a person's behaviour is predicted by his/her behavioural intention, which is influenced by his/her attitude towards the behaviour, among other factors. TRA theory focuses on predicting behavioural intention and actual behaviour. It is based on behavioural beliefs and subjective norms [60], [44] and [14]. In the context of the current study, the authors have used TRA to predict the actual use of knowledge sharing adoption in Saudi e-learning communities as being influenced by the users' behavioural usage intention, which in turn depends on the users' attitude and the subjective norms [12],[60]. In addition, previous researchers stated that knowledge initiates within individuals or groups and have classified knowledge management into individual and organisational dimensions. Reviewing the literature on knowledge management based on our understanding of the Saudi Arabian context led to the identification of four knowledge management organizational factors namely 'leadership support', 'knowledge sharing process' and 'organizational reward', and 'IT infrastructure' as well as two knowledge management individual factors, namely 'interpersonal trust', and 'people self-motivation' as influencing knowledge sharing attitude and behaviour, as illustrated in Figure 1 [8], [10], [32], [45]. Figure.1 shows the research model.
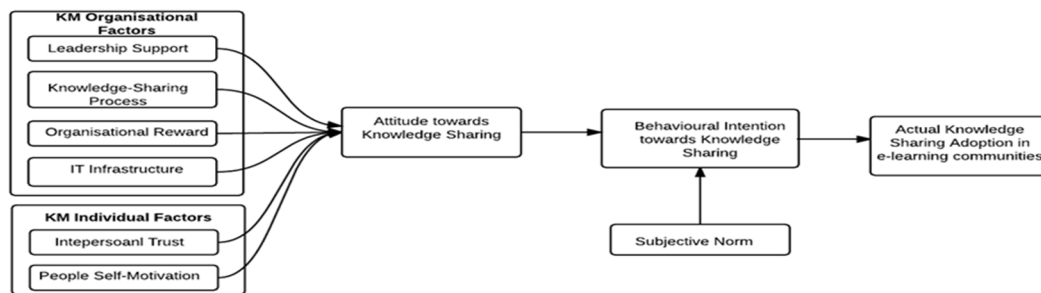

Fig. 1. Research Model

3.1 Hypotheses

Knowledge Management Organizational Factors

Researchers have confirmed that leadership has a strong relationship with employee attitude. For example, it has been highlighted that leaders' roles are important in sharing knowledge and the staff are influenced by the degree of top management adoption for knowledge sharing initiative [11], [49], [65]. This means that leaders' role in encouraging employees for new practices has an influence on the staff attitude towards adopting the practice; and this will affect employees to have a positive attitude towards knowledge sharing. The literature also suggests that rewards are effective factors which will make positive effect on employee attitude about sharing knowledge [33], [17]. In addition, [34] discussed that rewards have positive influence on the attitude in knowledge sharing contexts for academics. The effective use of knowledge

management is normally based on the use of information technology (IT) systems. Employees sharing knowledge by an IT system are required to be familiar with using the system. For the purpose of our research, the following hypotheses are developed:

Hypothesis 1: Leadership Support (LS) has a significant positive effect on the academics' attitude toward knowledge sharing adoption in Saudi universities' e-learning communities.

Hypothesis 2: Knowledge Sharing Process (KSP) has a significant positive effect on the academics' attitude toward knowledge sharing adoption in Saudi universities' e-learning communities.

Hypothesis 3: Organisational Reward (OR) has a significant positive effect on the academics' attitude toward knowledge sharing adoption in Saudi universities' e-learning communities.

Hypothesis 4: IT Infrastructure (ITIF) that supports knowledge sharing has a significant positive effect on the academics' attitude toward knowledge sharing adoption in Saudi universities' e-learning communities.

Knowledge Management Individual Factors

Trust leads to increased knowledge sharing and enhances the likelihood that the knowledge will be understood and applied. Trust is directly tied to the level of psychological safety in knowledge sharing – the more trust amongst participants, the more will be sharing of tacit knowledge [41]. There is a positive relationship between trust and knowledge sharing [3].

Without the initiative of participants and the aligning of the group and individual goals, effective knowledge sharing cannot be ensured. This belief is central to how people think and behave. In order to achieve a goal, a person has to believe that it can be possible and s/he can attain it [48]. However, in order to share knowledge it is not enough that the participants have an intrinsic desire to share knowledge, the knowledge producer must also perceive that the knowledge can be successfully applied. The more self-efficacy people have, the more confidence they will have about their own knowledge and their expertise. The intrinsic motivation and belief, thus leads to increased productivity and encourages the participants of the community to share more knowledge. Therefore, the following hypotheses are developed:

Hypothesis 5: Interpersonal Trust has a significant positive influence on staff attitude in Saudi universities' e-learning communities.

Hypothesis 6: People Self-Motivation has a significant positive influence on staff attitude in Saudi universities' e-learning communities.

Subjective Norms

Subjective norm reflects employee perceptions of whether the behaviour is accepted by the employee circle of influence or not. Previous research has identified that subjective norm has impact on an individual's behaviour [2], [64]. Therefore, the following hypothesis is developed.

Hypothesis 7: Subjective Norm (SN) of educators has a significant positive effect on their behavioural intention (BI) toward knowledge sharing adoption in Saudi universities' e-learning communities.

Attitude and Behavioural Intention

According to [28], attitude has an effect on behavioural intentions. The strong relationship between attitude and behavioural intention has received considerable empirical support [51], [18], [38]. The literature shows that people attitude regarding knowledge sharing reflect their willingness to be involved in the knowledge sharing adoption. Therefore the following hypotheses are proposed:

Hypothesis 8: Academics' Attitude (ATT) towards knowledge sharing adoption in Saudi universities' e-learning communities has a significant positive effect on the behavioural intention (BI) toward knowledge sharing practices in e-learning communities in Saudi Arabia.

Hypothesis 9: Academics' Behavioural Intention (BI) towards knowledge sharing adoption in Saudi universities' e-learning communities has a significant positive effect on the actual adoption of knowledge sharing practices in e-learning communities in Saudi Arabia.

4. Methodology

This study has used quantitative method to collect numerical data from respondents in Saudi universities. The survey instrument is used to collect data. Data has been collected in major public universities in Saudi Arabia. This research adopts previously validated instruments in order to ensure the survey items are adequate. The survey has been developed in English. A translated Arabic version has been included in the survey. The five point Likert scale (1=strongly disagree to 5=strongly agree) is used as it is one of the most commonly used techniques of scaling responses in a survey design. Survey was sent to 500 participants and 200 participated in the survey. After removing incomplete responses, a total of 160 responses have been used for data analysis. The research model has been tested using Partial Least Squares-Structural Equation Modelling (PLS-SEM) statistical technique using SmartPLS version 3 [53]. Partial Least Squares approach is used to test theoretical models and to understand the simultaneous modelling of relationships among various independent and dependent factors.

4.1 Data Analysis

Descriptive analysis shows that 60% of the participants are male and 40% are female. 55% are in the age bracket of 26-35 years, 30% participants are 36-45 years and 15% are above 45 years. 51% of the respondents hold Master degree, followed by bachelor's degree with 35% and 14% hold doctoral degree. 45% of participants have more than 5 years of work experience, followed by 30% between 3-5 years; 25% of the participants have work experience of 1-3 years.

The data has been analysed using Partial Least Squares (PLS) approach, which is considered to be suitable for this study. PLS allows the investigators to simultaneously evaluate structural path coefficients and measurement model parameters. It allows formative and reflective variables to be tested together [22]. In our research model all factors except subjective norms are modelled as reflective indicators because they are viewed as effects of latent variables. The subjective norms is formative in nature [27], which is not inter-changeable because it is a multidimensional variable, which means change in one indicator does not necessarily denote change in other indicator.

Reliability and Validity Assessment

The measurement model is assessed by internal consistency, convergent validity and discriminant validity. Convergent and discriminant validity are calculated using items loadings were at least 0.70 and the square root of the average variance extracted (AVE) from its factor indicators, which was at least 0.70 and was greater than that factor correlation with other factors. Subjective norm is a formative construct that cannot be examined in this procedure. However, the validity of subjective norm has been examined using outer weights that is significant at p value < 0.05. In addition for the reliability of formative indicator, the variance inflation factor (VIF) value is less than 5, which means there is no multicollinearity. Table 1 shows the average variance extracted (AVE), Cronbach's reliability, composite reliability and the AVE of all constructs values exceed the recommended value of 0.70.

Table 21. Reliability, Correlation, and Discriminant Validity of Constructs.

	AVE	Calpha	CR	LS	KSP	OR	ITIF	IPT	PSM	SN	ATT	BI	KSA
LS	0.82	0.89	0.83	**0.90**									
KSP	0.85	0.86	0.88	0.25	**0.92**								
OR	0.81	0.82	0.85	-0.39	-0.03	**0.90**							
ITIF	0.88	0.88	0.88	0.50	-0.00	-0.23	**0.93**						
IPT	0.81	0.87	0.65	0.33	0.08	-0.13	0.15	**0.90**					
PSM	0.80	0.77	0.71	0.51	0.70	0.26	0.21	0.20	**0.89**				
SN	NA	NA	NA	0.52	0.08	-0.23	0.50	0.31	0.12	1			
ATT	0.83	0.83	0.88	-0.03	-0.03	0.03	0.02	0.08	0.13	0.05	**0.91**		
BI	0.83	0.84	0.85	0.53	-0.08	-0.28	0.88	0.70	0.26	0.59	0.02	**0.91**	

| **KSA** | 0.88 | 0.83 | 0.88 | -0.32 | 0.09 | -0.33 | 0.01 | 0.09 | 0.04 | 0.07 | 0.08 | 0.00 | **0.93** |

Notes: 1. AVE: Average Variance Extracted, CR: Composite Reliability, C Alpha: Cronbachs Alpha
2. LS: Leadership support, KSP: Knowledge Sharing Process, OR: Organisation Reward, ITIF: IT Infrastructure, IPT: Interpersonal Trust; PSM: Peope-Self-Motivation SN: Subjective Norms, ATT: Attitude, BI: Behavioural Intention, KSA: Knowledge Sharing Adoption,
3. Diagonal elements are the square root of AVE.

Structural Model Testing

The structural model testing is conducted to test the proposed hypotheses. The significance of the paths between construct is analysed by t-test calculated with the bootstrapping technique at a 5 percent significance level. The coefficients of the causal relationships between factors are determined by the significance of the path coefficients and the (R^2) variance of the dependent construct. Table 2 shows the path co-efficient mean, standard deviation and t-statistics and p-value for each of the proposed hypotheses. The recommended t-values are $t > 1.96$ at $p < 0.05$, $t > 2.576$ at $p < 0.01$, $t > 3.29$ at $p < 0.001$ for two-tailed tests. Figure 2 shows the path testing.

Table 2. Hypotheses Testing.

	Path	Path coeffient mean	StDev	T statistics	P value	Supported?
H1	LS -> ATT	0.21	0.02	1.97	0.003*	Yes
H2	KSP -> ATT	0.33	0.04	2.65	0.000***	Yes
H3	OR -> ATT	0.14	0.03	1.10	0.25	No
H4	ITIF -> ATT	0.30	0.02	1.98	0.004*	Yes
H5	IPT -> ATT	0.24	0.05	6.29	0.000***	Yes
H6	PSM -> ATT	0.13	0.01	1.45	0.336	No
H7	ATT-BI	0.24	0.03	1.99	0.002*	Yes
H8	SN-> BI	0.55	0.04	3.90	0.000***	Yes
H9	BI -> KSA	0.42	0.07	2.10	0.000***	Yes

Notes:
- StDev: Standard deviation, LS: Leadership support, KSP: Knowledge Sharing Process, OR: Organisation Reward, ITIF: IT Infrastructure, SN: Subjective Norms, ATT: Attitude, BI: Behavioural Intention, KSA: Knowledge Sharing Adoption,
- *Significant at 0.05 level **, Significant at 0.01 level, *** Significant at 0.001 level
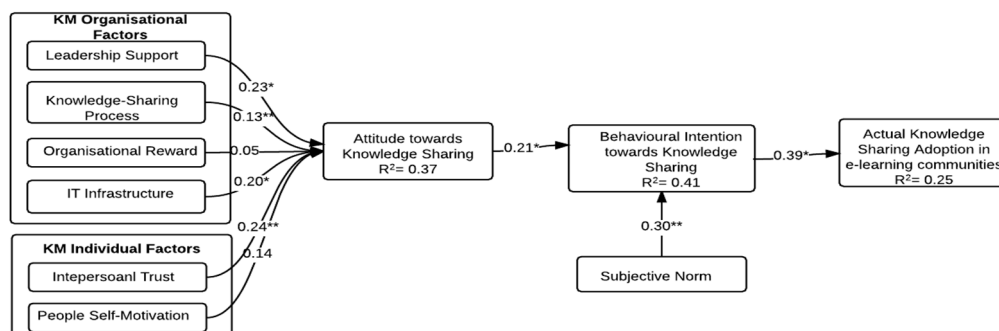
Fig. 2. Path Testing

As shown in the Table 2, the results confirm the relationship in significance for all hypotheses at p<0.05, except H3 where the relationship organisation reward and attitude is insignificant. $R^2=0.37$ indicates 37 percent variance in attitude. For the behavioural intention $R^2=0.41$ indicates 41 percent variance. $R^2=0.25$ indicates 25 percent variance in actual knowledge sharing adoption in Saudi e-learning communities.

5. Findings and Discussion

According to the path testing as shown in Figure 2, the order of significance among the knowledge management organisational factors that have a significant effect is "leadership support", followed by "IT infrastructure", "knowledge sharing process" and "organisational reward". The results confirm that 'leadership' is the most important factor to be associated with attitude towards knowledge sharing adoption in Saudi e-learning communities. It can be interpreted that academic staff share information and insights throughout the organization and have considerable influenced by the degree of top management adoption. This is consistent with [65], [30]. The organisation promotes a knowledge sharing culture that focuses on participation. Information technology infrastructure plays a successful role in e-learning adoption. In addition, giving incentives to employees helps to stimulate and reinforce the positive attitude. However, our results show the insignificant effect of "organisational reward" on attitude. This could be attributed to the fact that the data had been collected in Saudi Arabia and all the participants in the survey are Muslims. As per Islamic belief, rewards are encouraged by religion which is consistent with Prophet Mohammed's recommendation as reported by Ibn Mas`ud that The Prophet (PBUH) said: "Envy is permitted only in two cases: a man whom Allah gives wealth, and he disposes of it rightfully, and a man to whom Allah gives knowledge which he applies and teaches it". Hence participants are not accepting "organisational reward" as an important organisational factor in knowledge sharing. In addition, the reason behind the significance of "knowledge sharing process" is that sharing more accurate data and timely information with others is one of the biggest advantages towards e-learning communities. The results also confirm that individual attitude is the key factor of behavioural intention to adopt actual knowledge sharing adoption in Saudi e-learning communities. This is in line with related studies [40], [61].

The findings show the order of significance among knowledge-sharing individual factors is 'interpersonal trust' followed by 'people self-motivation'. This indicates 'interpersonal trust' and 'people self-motivation' is more likely to be associated with staff attitude towards knowledge-sharing adoption. This shows knowledge-sharing is expected to be more in e-learning communities where there is a culture of trust amongst the staff members. Also, when the staff motivate oneself, they are likely to contact more and share knowledge, which leads to the generation of more knowledge. The results are consistent with [41,42] and [3].

The results also confirm that staff attitude and subjective norm is the key factor of behavioral intention to adopt actual knowledge-sharing adoption in Saudi e-learning communities. In the context of the current study, the actual use of knowledge-sharing adoption in Saudi e-learning communities is influenced by the staff behavioural usage intention, which in turn depends on the users' attitude and the subjective norms. The results are consistent with [58], [41] and [56].

6. Conclusion and Implication

The study has fulfilled its main aim that was to examine the key factors that influence the adoption of knowledge sharing activities in Saudi universities' e-learning communities. Data was collected from various public universities in Saudi Arabia and total of 160 responses were used for analyses. Partial least square approach was used to test the hypotheses of the study. The results indicated that among knowledge management organisational factors, 'leadership support', 'knowledge sharing process' and 'IT infrastructure' is positively and significantly related to staff knowledge sharing attitude. However 'organization rewards' did not significantly affect attitude. In addition, among knowledge management individual factors, 'interpersonal trust' is positively supported, while 'people self-motivation' doesn't have a positive effect on staff knowledge sharing attitude. Among other factors, subjective norm and attitude significantly impact 'behavioural intention' toward knowledge sharing adoption in the Saudi universities' e-learning communities.

Concerning implications from a theoretical perspective, this study contributes to the literature by presenting a proposed knowledge sharing adoption model in the academic context towards

the e-learning communities. Practically, therefore, in an effort to make academic staff to adopt knowledge sharing practices, Saudi universities should implement supportive knowledge management practices to build actual knowledge sharing practices in the organization from information system point of view. As a result, e-learning stakeholders will gain advantages from knowledge management practices to share what they create and capture which will maximize the community's knowledge resulting in more production for the open educational resources and organization goals achievement as well [5]. The findings can be implemented by developing the e-learning communities with considering a solid information system that can serve the process of knowledge sharing and production by all users involved.

6.1 Limitation and Future Research

Like any research this study has limitations. First, the data collection was restricted to academic staff in public universities in Saudi Arabia, which may affect the generalization of the study. Second, this study did not cover all aspects of knowledge sharing adoption. Third, this study did not consider the type of knowledge sharing. Thus, this is an area for future research to consider.

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