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Int J Edu Sci, 20(1-3): 120-136 (2018)
DOI: 10.31901/24566322.2018/20.1-3.15

Assessment of Knowledge Management Practices in Higher Educational Institutions in India: A Structural Equation Modeling Approach

V. Kumaravel[1] and P. Vikkraman[2]

[1]Anna University, Chennai and Vivekanandha Business School for Women, Elayampalayam, Tiruchengode 637 205, Namakkal District, Tamil Nadu, India
[2]Department of Management Studies, Anna University Regional Campus, Maruthamalai Main Road, Navavoor, Coimbatore 641 046, Tamil Nadu, India
Mobile: [1]<91 9842510595>, [2]<91 8778063690>
E-mail:[1]<kumarvelmba@gmail.com>, [2]<dr.p.vikkraman@gmail.com>

KEYWORDSAcademic. Collaboration. Enablers. Learning. Technology.Trust

ABSTRACTKnowledge Management (KM) is a new emerging field of research in the educational environment. The main objective of the paper is to analyze the knowledge management readiness in higher educational institutions in India. A survey has been conducted through questionnaire from 540 faculty members working in higher educational institutions in India through Knowledge Management Assessment Instrument (KMAI) and Knowledge Management Enablers Scale (KMES). Structural Equation Modeling has been used to analyze the data. The present paper also makes an attempt to investigate the impact of Knowledge Management Enablers Scale (KMES) on Knowledge Management Assessment Instrument (KMAI). The research findings indicate that there is a strong positive impact of KMES factors on KMAI factors. KM enablers are the critical success factors of KM implementation in Higher Educational Institutions (HEIs). Therefore it is recommended to improve the KM enabling factors in the organization in order to enhance the knowledge management practices.

INTRODUCTION

Knowledge has become the key asset for the economy to gain competitiveness. The knowledge-based economy is expected to promote an environment for innovation by reinforcing the delivery of better quality education and fostering innovation and technology (Pook et al. 2017). Higher education institutions are providing important benefits to the business world and the society at large by creating and diffusing new knowledge (Kalkan 2017a). In the emerging knowledge society, universities are the expected drivers of innovation, thereby contributing to the development of a learning society. Universities are the intellectual center of knowledge production and research. They are responsible for education, research, and knowledge transfer to society, hence, contributing to national development (Ojo 2016). Knowledge Management (KM) practices play a vital role in promoting teaching and learning at various levels of the academic institutions. Higher education institutions ensure that knowledge is shared among lecturers, researchers and students and advocate the knowledge that clearly fall within the realm of knowledge management (Bimol et al. 2017). KM provides a systematic process to help in the creation, transfer, and application of knowledge across the higher educational institutions. KM activities may help Higher Educational Institutions (HEIs) to develop and update the modern educational content, enhance and leverage the effectiveness of scientific research and its innovation among the faculty members and students (Kalkan 2017b). The HEIs have significant opportunities to apply knowledge management practices in day-to-day activities from teaching to research. An institution's extensive approach to the KM practices lead to exponential improvements in sharing the academic knowledge; both explicit and implicit. It provides aid to better decision-making capabilities, reduced staff turnover, development of teaching effectiveness and enhancing collaborative research. HEIs create and apply knowledge during their processes and activities. The growth in the number of Higher Educational Institutions in India in the last decade has increased competition and the pressures for performing better. This has forced the educational institutions to recognize the need for knowledge management initiatives, which is a key asset for development (Bhusry and Ranjan 2011). Assessment of knowledge management readiness indicates the current status of KM initiatives in the HEIs and also shows necessary changes to be followed for effective implementation of KM practices.

Objectives of the Paper

The main objective of the paper is to assess the readiness of knowledge management implementation in higher educational institutions in India. The specific objective of the paper includes,

1. To review the literature on assessment of knowledge management readiness in general.
2. To examine the readiness of KM implementation through KM assessment instrument (KMAI) and KM enablers scale (KMES)
3. To investigate the impact of knowledge management enablers on knowledge management assessment instrument.

Review of Literature

Mohammadi et al. (2009), described that, implementing knowledge management in an organization require significant organizational prerequisites. Lacking proper infrastructures and prerequisite, not only make the knowledge management process unsuccessful, but might incur harmful effects as well. To decrease such risks, he proposed to introduce the readiness assessment, in order to gauge a company's appetite for the work involved in implementing the knowledge management.

Bhusry and Ranjan (2011) stated that Information Technology based Knowledge Management intervention in HEIs can prove to be a promising techno management tool to enhance performance in the vital areas of teaching and learning, research and administrative services. Based on the research results the authors have presented a conceptual framework for implementation of knowledge management systems in higher educational institutions.

Shahriza et al. (2012) made an attempt to investigate the knowledge management readiness by using KM SECI processes in Sri Lankan telecommunication industry. The KM SECI processes comprised of socialization, externalization, combination, and internalization.The research finding indicated that the all four variables of the intention to be involved in KM SECI processes emerged as significant and reliable measures for KM readiness. The research finding also revealed that the positive level of intention among the employees in the Sri Lankan telecommunication industry to be involved in KM processes.

Akhavan et al. (2012) stated that the organization infrastructure and processes are not appropriate for implementing knowledge management, and then the human and financial resources will be wasted. They further stated that it is essential that organizations evaluate their readiness in this area before implementing the knowledge management. They also identify the critical success factors of KM such as knowledge strategy, management support and commitment, performance measurement, structures, organizational learning, investment, culture of knowledge sharing, motivation, collaboration, communication and team working, technical infrastructures, operation integration, and security.

Pradan et al. (2015) opined that when a key employee leaves the organization, knowledge will disappear and the competitive advantage of the organization will be lost. He further stated that the Knowledge Management System is referred as information system that applied to manage organizational knowledge by supporting and enhancing the organizational process of knowledge creation, storage/retrieval, transfer, and application.

Ojo (2016) proposed a conceptual model for implementation of knowledge management in Nigerian universities in order to drive innovation and performance. Based on literature survey from the previous researches, he has developed the conceptual model describing ways in which universities can adopt knowledge management practices and strategies in order to promote innovation and improve performance of universities.

Youssef et al. (2017) examined the impact of: openness and trust; top management support; and the reward system on knowledge sharing behaviour in multiple industries in Saudi Arabia. They also investigated how knowledge sharing behaviour impacts on organization's competitiveness by using structural equation model. The research findings indicated that there was a moderate relationship between the knowledge sharing behaviour and the three independent latent variables such as openness and trust; top management support; and the reward system. The research results also found that there was a strong positive association between knowledge sharing behaviour and firm's competitiveness.

METHODOLOGY

In the present research, both descriptive research and exploratory research design have been used to fulfill the objectives of the research. The descriptive research design has been used to ascertain the opinion of faculty members on knowledge management readiness through KM assessment instrument and KM enablers scale. The exploratory research design has been used to investigate the impact of knowledge management enablers on knowledge management assessment instrument. The questionnaire consists of three parts namely, personal profile, knowledge management assessment instrument and knowledge management enablers scale. The survey was conducted from July 2016 to January 2017.The primary data have been collected from 600 faculty members of higher educational institutions in Namakkal district, TamilNadu, India. Out of which 60 questionnaires were incomplete and eliminated from the analysis. Finally, 540 samples were taken up for analysis. The structural equation modeling has been used to analyse the data and develop a model on impact of knowledge management enablers on assessment of knowledge management readiness in higher educational institutions in India.

RESULTS AND DISCUSSION

Knowledge management (KM) comprises a wide range of practices used by organizations such as Creating knowledge, Capturing knowledge, Organizing knowledge, Storing knowledge, Disseminating knowledge and Applying knowledge in an appropriate way (Sayyed et al. 2011). In recent years, there has been proliferation of knowledge management projects in many organizations. Before implementing knowledge management projects in an organization, it is necessary to analyse the organizational readiness for effective implementation of KM process;otherwise it not only makes the knowledge management process unprofitable, but also it might incur harmful effects. To decrease such risks, it is proposed to introduce the readiness assessment, in order to gauge an organizational appetite for the work involved in implementing the knowledge management practices. Shahidi et al. (2015) have identified the readiness factors of the knowledge management system implementation such as organizational culture, information technology infrastructure; senior management commitment, and strategies. Whereas Fitriani et al. (2017) have identified few more factors such as organizational culture, IT infrastructure and individual acceptance factors.

The practices of knowledge management have been successfully implemented in higher educational institutions in various countries such as UK (Cranfield and Taylor 2008), South Africa (Mutula and Jacobs 2010), Thailand (Songsangyos 2012), Malaysia (Ismail and Yang 2007, Yaakub et al. 2014), Greece (Lamprini and Nasiopoulos 2014), Mongolia (Demchig 2014), Taiwan (Mary and Yeh 2011). In India, application of KM in academic institutions is only in initial stage. Hence, this research has made an attempt to analyze the readiness of higher educational institutions for KM implementation through measuring the perception of faculty members in higher educational institutions on various process of KM. The assessment of KM readiness provides answers to two fundamental questions: What is an organization's current KM capability? And what are the changes must be taken place before implementing KM initiatives? To find the answer to the above questions, an instrument to assess the KM readiness has been developed based on the literature survey and data collected in selected higher educational institutions. The structural equation modeling has been used to analyze the data and results are presented in this part.

The attributes of Knowledge Management Assessment Instrument have been studied through six factors, *viz.* Creating knowledge (KM1), Capturing knowledge (KM2) Organizing knowledge (KM3), Storing knowledge (KM4), Disseminating knowledge (KM5) and Applying knowledge (KM6).

Modeling for Knowledge Management Assessment Instrument

In order to see how these six factors are contributing to Knowledge Management Assessment Instrument, the researchers deployed the technique of confirmatory factor analysis through structural equation modeling. Before going in to the detailed modeling, the factors taken for research are tested for validity through measurement models through AMOS software. The results for each variable are being discussed in this part.

Creating Knowledge

Every academic institution contributes to knowledge creation. The main sources of knowledge creation in higher education institutions are through educational and research activities, innovation and learning. The academic institutions are considered as "Knowledge Houses" where knowledge flows from teachers to students and new knowledge is created (Dhamdhere 2015). The individual reliability of the factor knowledge creation along with its validity is being depicted in the following table. The measurement model for creating knowledge (KM1) is presented in Table 1.

The individual reliability of the items was evaluated using factor loadings (Camison and Vilar-Lopez 2010). Carmines and Zeller (1979) has propagated that the factor loadings should not be less than 0.707 to constitute a valid model. However, some researchers such as Barclay et al. (1995) and Chin (1998) are of the opinion that factor loadings to the extent of 0.5 or 0.6 is acceptable. In terms of the research and recommendation of Hau et al. (2004), the researchers selected goodness of fit indicators like χ^2, GFI, RMSEA to examine the degree of model fit. During these indicators, it's better for Chi-square test not to reach significance. But the value of Chi-square is easily influenced by sample size. If the sample size is large, the value is easy to reach significance. CFI is a goodness of fit index with many strong points, which has less impact from sample size. Even though RMSEA is also influenced by sample size, it is insensitive to the misspecification model with few parameters, so it is also rarely influenced by sample size, the smaller the value of RMSEA is, and the fitter the model is. The results of the model shows the Chi-square value of 6.976, with p =.031, GFI = 0.994; and RMSEA = 0.068 were presented in the Table 1. The values of the goodness of fit indices suggest a reasonably high-fitting model.

Capturing Knowledge

Knowledge capture is the process by which knowledge is converted from tacit to explicit form (residing within people, artifacts or organizational entities) and vice versa through the sub-processes of externalization and internalization (Becerra-Fernandez and Sabherwal 2010). The individual reliability of the factor knowledge capture along with its validity is presented in Table 2.

The results of the model shows the Chi-square value of 4.209, with p =.040, GFI = 0.996; and RMSEA = 0.077 were presented in Table 2. The values of the goodness of fit indices suggest a reasonably good-fitting model.

Table 1: Measurement model - Creating knowledge (KM1)

Item	*Standardized solution (R)*	*R-square*	*Chi-square*	*Degrees of freedom*	*P*	*GFI*	*RMSEA*
KM1a	.67	.45					
KM1b	.70	.49					
KM1c	.72	.52	7.0	2	.031	.994	.068
KM1d	.69	.47					

Source: Computed from primary data

Table 2: Measurement model - Capturing knowledge (KM2)

Item	*Standardized solution (R)*	*R-square*	*Chi-square*	*Degrees of freedom*	*P*	*GFI*	*RMSEA*
KM2a	.67	.45					
KM2b	.81	.66					
KM2c	.70	.49	4.2	1	.040	.996	.077
KM2d	.50	.25					

Source: Computed from primary data

Organizing Knowledge

The captured knowledge is needed for filtering, cross listing and integrating different sources and types of knowledge according to the need of the organization. Organizing the knowledge is helpful to review the knowledge on a regular basis in order to keep the knowledge current and up to date. The individual reliability of the factor organizing knowledge along with its validity is presented in Table 3.

The results of the model shows the Chi-square value of 0.491, with p =.483, GFI = 1.000; and RMSEA = 0.000 were given in Table 3. The values of the goodness of fit indices suggest a reasonably high-fitting model.

Storing Knowledge

Knowledge may be explicit or tacit. Explicit knowledge is once stored in documents and other storage systems. It can be shared and expressed. Tacit knowledge on the other hand is ease stored in the human minds and includes the intellect, experience, thoughts, intuitions (Manoj and Manpreet 2016). The educational institution utilizes databases, repositories and information technology applications to store knowledge for easy access to all. The individual reliability of the factor storing knowledge along with its validity is presented in Table 4.

The results of the model shows the Chi-square value of 0.000, with p =.987, GFI = 1.000; and RMSEA = 0.000 were given in the Table 4. The values of the goodness of fit indices suggest a reasonably high-fitting model.

Disseminating Knowledge

The Knowledge sharing is envisaged as a natural activity of the academic institutions as the number of seminars, conferences and publications by academics is far exceeding any other profession, signifying the eagerness of academics to share knowledge (Cheng et al. 2013). The libraries, resource center, internet and intranet and other forums to display, are used in educational institutions to disseminate knowledge among the faculty members and students. The individual reliability of the factor disseminating knowledge along with its validity is being depicted in Table 5.

The results of the model shows the Chi-square value of 1.778, with p =.182, GFI = 0.998; and RMSEA = 0.038 were given in the Table 5. The values of the goodness of fit indices suggest a reasonably high-fitting model.

Applying Knowledge

The knowledge generated in higher educational institutions is consumed by faculty members, students, administration, and researchers. The purpose of knowledge management is to create, develop, store, share and apply it effectively to achieve the strategic objectives of the

Table 3: Measurement model - Organizing knowledge (KM3)

Item	*Standardized solution (R)*	*R-square*	*Chi-square*	*Degrees of freedom*	*P*	*GFI*	*RMSEA*
KM3a	.70	.49					
KM3b	.82	.68					
KM3c	.70	.49	0.5	1	.483	1.000	.000
KM3d	.63	.40					

Source: Computed from primary data

Table 4: Measurement model - Storing knowledge (KM-4)

Item	*Standardized solution (R)*	*R-Square*	*Chi-Square*	*Degrees of freedom*	*P*	*GFI*	*RMSEA*
KM4a	.66	.43					
KM4b	.80	.65					
KM4c	.62	.38	.000	1	.987	1.000	.000
KM4d	.5	.25					

Source: Computed from primary data

Table 5: Measurement model - Disseminating knowledge (KM-5)

Item	*Standardized solution (R)*	*R-square*	*Chi-square*	*Degrees of freedom*	*P*	*GFI*	*RMSEA*
KM5a	.55	.30					
KM5b	.63	.39					
KM5c	.85	.73	1.8	1	.182	.998	.038
KM5d	.72	.51					

Source: Computed from primary data

organization. The application of knowledge is to encourage learning and innovation as sources of competitive advantage. The individual reliability of the factor applying knowledge along with its validity is being depicted in Table 6.

The results of the model shows the Chi-square value of 0.000, with p =.987, GFI = 0.987; and RMSEA = 0.000 were given in Table 6. The values of the goodness of fit indices suggest a reasonably high-fitting model.

The analysis of measurement models for all the six factors of Knowledge Management Assessment Instrument verify that each of the factors is well explained by their corresponding variables through the statements in the questionnaire. However, to see if all these six factors contribute to the Knowledge Management Assessment Instrument (KMAI) as a whole are tested again through a model as depicted in Table 7.These results reveal that all the pre-requisites for the acceptance of the Measurement model are nearly met. After establishing the individual item reliability of the model, the validity of the model is next tested.

It can be seen from the Table 7 that the construct reliability for all the factors is well above the accepted level of 0.6 (Fornell and Larcker 1981). Also the AVEs for the factors are nearabout 0.5 for all the factors and hence all the measurable items meet the desirable validity. Hence it has been decided to take the average values of variables for each factor to frame model between Knowledge Management Assessment Instrument and Knowledge Management Enablers Scale. The correlation between each pair of the factors in the Knowledge Management Assessment Instrument is also studied to examine the relationships among them and the same is depicted in Table 8.

It can be observed from the Table 8 that there is almost perfect positive correlation (0.998) between the factors KM1 (Creating knowledge) and KM2 (Capturing knowledge); there is a strong positive correlation (0.939) between KM2 (Capturing knowledge) and KM3 (Organizing knowledge). It can also be observed there is a strong correlation between almost all the pairs of factors of Knowledge Management Assessment Instrument.

Modeling for Knowledge Management Enablers Scale

Knowledge Management Enablers (KME) is the facilitators which supports the process of knowledge management effectively. KME factors have the power to guide implementation of knowledge management in the organization. Based on literature survey, it was found that there are more than 30 KME's were discussed in various research studies (Kumar et al. 2014). From these enablers, there are four enablers are considered as most important KME's such as technology (KME1), organizational structure (KME2), collaboration (KME3) and Trust(KME4) (Lee 2017).

Table 6: Measurement model - Applying knowledge (KM-6)

Item	*Standardized solution (R)*	*R-square*	*Chi-square*	*Degrees of freedom*	*P*	*GFI*	*RMSEA*
KM6a	.62	.38					
KM6b	.60	.36					
KM6c	.82	.68	.000	1	.987	1.000	.000
KM6d	.72	.52					

Source: Computed from primary data

Table 7: Estimates of the variables using the model – KMAI

Items	*Standard solutions*	*Factor estimate*	*Critical ratio*	*Error variance*	R^2	*C R*	*AVE*
			KM1 – Creating Knowledge				
KM1a	0.677	0.820	14.815	0. 413	0.458		
KM1b	0.664	0.838	14.535	0.463	0.441		
KM1c	0.727	1.106	15.873	0.568	0.529	0.832	0.481
KM1d	0.705	1.000	***	0.525	0.498		
			KM2 – Capturing Knowledge				
KM2a	0.638	0.910	13.526	0.581	0.408		
KM2b	0.690	0.984	14.480	0.516	0.476		
KM2c	0.759	1.091	15.740	0.423	0.576	0.780	0.475
KM2d	0.665	1.000	***	0.610	0.442		
			KM3 – Organizing Knowledge				
KM3a	0.681	0.868	15.131	0.499	0.464		
KM3b	0.770	0.928	17.119	0.339	0.593		
KM3c	0.751	1.060	16.695	0.499	0.564	0.821	0.535
KM3d	0.721	1.000	***	0.528	0.520		
			KM4 – Storing Knowledge				
KM4a	0.690	1.000	14.218	0.493	0.476		
KM4b	0.708	0.942	14.551	0.456	0.501	0.735	0.479
KM4c	0.678	0.931	***	0.607	0.460		
			KM5 – Disseminating Knowledge				
KM5a	0.709	1.019	14.137	0.498	0.503		
KM5b	0.748	1.037	14.759	0.410	0.560		
KM5c	0.729	1.031	14.449	0.456	0.531	0.807	0.511
KM5d	0.671	1.000	***	0.591	0.451		
			KM6 – Applying Knowledge				
KM6a	0.737	0.981	15.433	0.397	0.543		
KM6b	0.633	0.899	13.425	0.592	0.401		
KM6c	0.735	1.053	15.406	0.461	0.541	0.797	0.490
KM6d	0.689	1.000	***	0.542	0.475		

Source: Computed from primary data
* Composite reliability
** Average Variance Extracted
*** This regression weight was fixed at 1.000, not estimated.
Where

$$\text{Construct Reliability} = \frac{(\Sigma \text{Standardized Loadings})^2}{(\Sigma \text{Standardized Loadings})^2 + \Sigma e_j}$$

$$\text{Average Variance Extracted} = \frac{(\text{Standardized Loadings})^2}{n}$$

e_j is the measurement error

In order to see how above four factors are contributing to Knowledge Management Enablers Scale, the researchers deployed the technique of confirmatory factor analysis through structural equation modeling. Before going in to the detailed modeling, the factors taken for research are tested for validity through measurement models through AMOS software. The result for each variable is being discussed in this part.

Technology

Information technology plays a vital role in facilitating knowledge management practices in

Table 8: Correlations among factors of knowledge management assessment instrument

Factor 1		Factor 2	Correlation
KM1	<—>	KM2	.998
KM1	<—>	KM3	.909
KM1	<—>	KM4	.846
KM1	<—>	KM5	.761
KM1	<—>	KM6	.857
KM2	<—>	KM3	.939
KM2	<—>	KM4	.865
KM2	<—>	KM5	.757
KM2	<—>	KM6	.898
KM3	<—>	KM4	.901
KM3	<—>	KM5	.740
KM3	<—>	KM6	.868
KM4	<—>	KM5	.855
KM4	<—>	KM6	.891
KM5	<—>	KM6	.841

Source: Computed from primary data

the organization. The significant role of information technology is its ability to support knowledge communication, collaboration, knowledge transfer and enable team work in the organization. The information technology that is a part of effective knowledge management can be classified into two types: communication technologies such as electronic mails, video conferencing, electronic bulletin boards and computer conferencing and decision making technology such as decision support systems, expert systems and executive information systems (Allameh et al. 2011). The individual reliability of the factor Technology along with its validity is being depicted in Table 9.

The results of the model shows the Chi-square value of 17.680, with p =.001, GFI = 0.988; and RMSEA = 0.095 were given in Table 9. The values of the goodness of fit indices and RMSEA do not satisfy the norms for a good model. Hence the statement pertaining to the code KME1a - My institution provides information technology support for collaborative work regardless of time and place with moderate loading (0.58) and not explaining to the total variation has been removed from the model and the revised model is depicted in Table 10.

The results of the model shows the Chi-square value of 1.552, with p =.213, GFI = 0.999; and RMSEA = 0.032 were given in Table 10. The values of the goodness of fit indices and RMSEA suggest a high fitting model.

Organizational Structure

The organizational structure is one of the key enablers in effective implementation of knowledge management in an organization. The organizational structure defines the relationship of various departments, divisions and the hierarchy of the organization. The organizational structures facilitate knowledge infrastructure support, structural flexibility, freedom, scope and team work for effective knowledge sharing, coordination and across the organization (Manoj and Manpreet 2016).

The results of the model for KME-2 Organizational Structure with 10 items show the Chi-

Table 9: Measurement model - Technology (KME-1)

Item	Standardized solution (R)	R-square	Chi-square	Degrees of freedom	P	GFI	RMSEA
KME1a	.58	.34					
KME1b	.74	.55					
KME1c	.78	.61	17.680	3	.001	.988	.095
KME1d	.82	.67					
KME1e	.71	.50					

Source: Computed from primary data

Table 10: Measurement model - Technology (KME-1 – Revised)

Item	Standardized solution (R)	R-square	Chi-square	Degrees of freedom	P	GFI	RMSEA
KME1b	.76	.58					
KME1c	.75	.57	1.552	1	.213	.999	.032
KME1d	.86	.74					
KME1e	.69	.47					

Source: Computed from primary data

square value of 88.508, with p =.000, GFI = 0.968; and RMSEA = 0.069. The values of the goodness of fit indices and RMSEA do satisfy the norms for a good model, but however the small loadings for several statements KME2a, KME2f, KME2g, KME2h, KME2i, and KME2j (below 0.5) and hence these statement not explaining to the total variation have been removed from the model and the revised model depicted in the Table 11.

The results of the model shows the Chi-square value of 0.005, with p =.944, GFI = 1.000; and RMSEA = 0.000 were given in Table 11. The values of the goodness of fit indices and RMSEA suggest a high fitting model.

Collaboration

The collaborative practices in the organization provide the opportunity for the communication of ideas and knowledge among the employees. It is helpful to knowledge sharing and knowledge transfer activities in the organization. Collaboration consists of the combination of communication, coordination and cooperation. Communication is related to the exchange of ideas and information among the employees in the organization. Coordination is related to the management of employees' activities and resources, and cooperation is related to the production taking place on a shared space (Yahia et al. 2012).

The results of the model for KME-3 Collaboration show the Chi-square value of 147.465, with p =.000, GFI = 0.898; and RMSEA = 0.230. The values of the goodness of fit indices and RMSEA do not satisfy the norms for a good model. Hence the statement pertaining to the code KME3e - There is a willingness within my institution to accept responsibility for failure (0.54), not explaining to the total variation has been removed from the model and the revised model is depicted in Table 12.

The results of the model show the Chi-square value of 0.000, with p =1.000, GFI = 1.000; and RMSEA = 0.000 were given in Table 12. The values of the goodness of fit indices and RMSEA suggest a high fitting model. Also it is observed that there are some interrelationships between the statements KME3a and KME3d as well as between KME3c and KME3d.

Trust

Trust is one of the important factors that affect the relationship among the people. It leads to working together and collaboration among the employees in the organization. Failure in trust creates barriers to flow of information and knowledge shading in the organization. The success of knowledge management initiatives based on the trust worthiness of employees towards management of the organization. The individual reliability of the factor Trust along with its validity is being depicted in Table 13.

The results of the model show the Chi-square value of 16.473, with p =0.006, GFI = 0.990; and RMSEA = 0.065 were given in Table 13. The val-

Table 11: Measurement model - KME-2 organizational structure (Revised)

Item	*Standardized solution (R)*	*R-square*	*Chi-square*	*Degrees of freedom*	*P*	*GFI*	*RMSEA*
KME2b	.75	.56					
KME2c	.89	.80					
KME1d	.69	.41	.005	1	.944	1.000	.000
KME1e	.64	.40					

Source: Computed from primary data

Table 12: Measurement model - KME-3 collaboration (Revised)

Item	*Standardized solution (R)*	*R-square*	*Chi-square*	*Degrees of freedom*	*P*	*GFI*	*RMSEA*
KME3a	.58	.34					
KME3b	.92	.85					
KME3c	.78	.61	.000	0	1.000	1.000	.000
KME3d	.44	.19					

Source: Computed from primary data

Table 13: Measurement model - KME-4 trust

Item	*Standardized solution (R)*	*R-square*	*Chi-square*	*Degrees of freedom*	*P*	*GFI*	*RMSEA*
KME4a	.58	.34					
KME4b	.80	.64					
KME4c	.83	69	16.473	5	.006	.990	.065
KME4d	.78	.61					
KME4e	.70	.49					
KME4f	.73	.53					

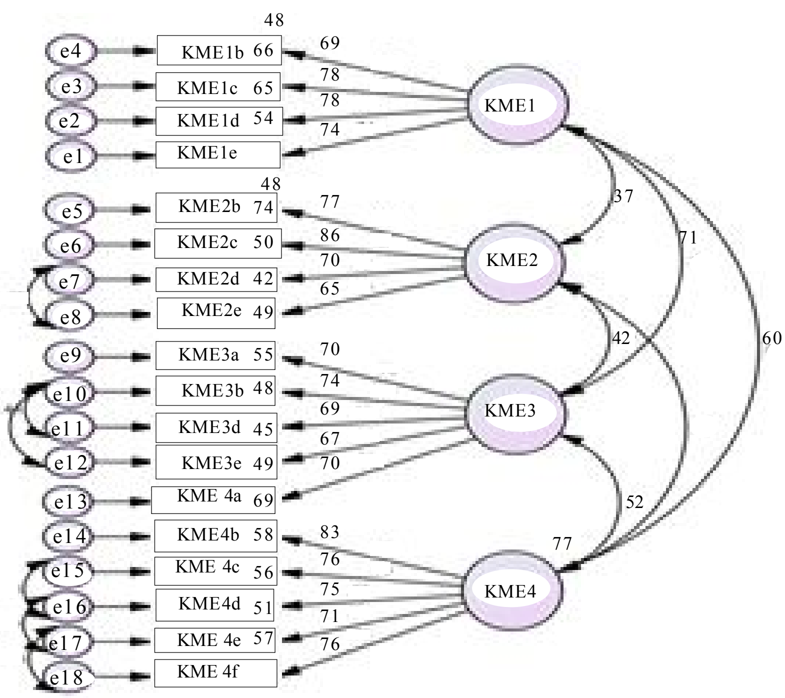
Source: Computed from primary data

ues of the goodness of fit indices and RMSEA suggest a high fitting model. Also it is observed there are some interrelationships between the statements KME4a and KME4b, KME4a and KME4c, KME4d and KME4e as well as between KME4e and KME4f. There is a negative relationship between the statements KME4a and KME4c.

The analysis of measurement models for all the four factors of Knowledge Management Enablers Scale verify that each of the factors is well explained by their corresponding variables through the statements in the questionnaire. However, to see if all these six factors contribute to the Knowledge Management Enablers Scale (KMES) as a whole are tested again through a model as depicted in the following Figure 1.

The result of model reveals that, all the prerequisites for the acceptance of the Measurement model are nearly met. After establishing the individual item reliability of the model, the validity of the model is next tested. The results are presented in Table 14.

It can be seen from Table 14 that the construct reliability for all the factors is well above the accepted level of 0.6 (Fornell and Larcker 1981). Also the AVEs for the factors are near



CHI-SQ=401.22; DF=123; P-.000; GFI=.922; RMSEA=.065

Fig. 1. KME full model

about 0.5 for all the factors and hence all the measurable items meet the desirable validity. The correlations among factors of Knowledge Management Enablers Scale were presented in Table 15.

It can be observed from Table 15 that there is positive correlation (.774 and .705) between the factors KME3 (Collaboration) and KME4 (Trust) and between KME1 (Technology) and KME3 (Collaboration); there is a moderate positive correlation (.597 and .525) between KME1 (Technology) and KME4 (Trust). It can also be observed there is a low positive correlation between KME2 (Organizational culture) and KME1 (Technology) and KME2 (Organizational culture). Ying Jung Yeh et al. (2006) also found that culture is most important but needs to be supplemented by technology.

Table 15: Correlations among factors of knowledge management enablers scale

Factor 1		*Factor 2*	*Correlation*
KME1	<—>	KME2	.370
KME1	<—>	KME3	.705
KME1	<—>	KME4	.597
KME2	<—>	KME3	.418
KME2	<—>	KME4	.525
KME3	<—>	KME4	.774

Source: Computed from primary data

Table 14: Estimates of the variables using the model – KME

Items	*Standard solutions*	*Factor estimate*	*Critical ratio*	*Error variance*	*R^2*	*CR*	*AVE*
			KMES1 – Technology				
KME1b	0.691	0.874	14.93	0.467	0.477		
KME1c	0.784	1.039	16.81	0.379	0.615		
KME1d	0.779	1.045	16.728	0.395	0.607	0.840	0.561
KME1e	0.738	1.000	***	0.467	0.545		
			KMES2 – Organizational Structure				
KME2a	0.765	1.030	14.252	0.588	0.585		
KME2b	0.862	1.117	14.795	0.34	0.743		
KME2c	0.704	1.015	17.533	0.81	0.496	0.761	0.562
KME2d	0.651	1.000	***	1.062	0.424		
			KMES3 – Collaboration				
KME3a	0.702	1.085	13.738	0.55	0.493		
KME3b	0.745	1.108	13.036	0.448	0.555		
KME3c	0.692	1.059	13.449	0.556	0.479	0.822	0.493
KME3d	0.668	1.000	***	0.565	0.446		
KME4a	0.703	1.093	13.753	0.555	0.494		
			KMES4 – Trust				
KME4b	0.828	1.097	18.298	0.327	0.686		
KME4c	0.762	0.966	19.611	0.400	0.581		
KME4d	0.748	1.000	***	0.467	0.560	0.868	0.582
KME4e	0.714	0.947	18.537	0.511	0.510		
KME4f	0.757	1.055	16.78	0.494	0.573		

Source: Computed from primary data
* Composite reliability
**Average Variance Extracted
*** This regression weight was fixed at 1.000, not estimated.
Where,

$$\text{Construct Reliability} = \frac{(\Sigma \text{Standardized Loadings})^2}{(\Sigma \text{Standardized Loadings})^2 + \Sigma e_j}$$

$$\text{Average Variance Extracted} = \frac{(\text{Standardized Loadings})^2}{n}$$

e_j is the measurement error

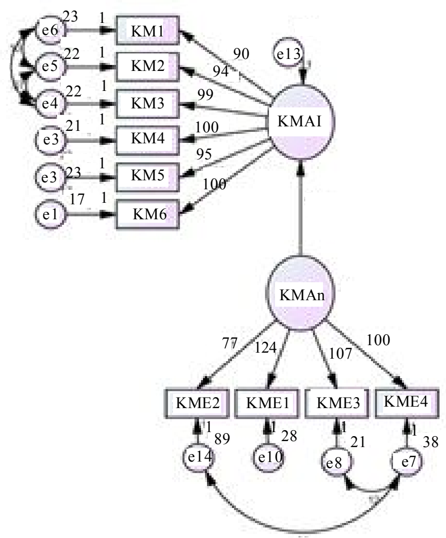
Structural Model

Structural Equation Modeling was employed through Path analysis to examine the impact of Knowledge Management Assessment Instrument (KMAI) on Knowledge Management Enablers Scale (KMES). Path analysis (Sewall Wright) is a method employed to determine whether or not a multivariate set of non-experimental data fits well with a particular (a priori) causal model (Pedhazur 1982).The model involving all the attributes of KMAI and KMES taken for the research is depicted in the Figure 2.

Table 16 gives the estimates of regression coefficients (unstandardized and standardized) of KMAI and KMES variables taken for analysis along with correlations among these two variables.

It can be seen from the Table 16 that all the variables of KMAI have standardized loading above 0.7 thus contributing to the variations in Knowledge Management Assessment Instrument ($p < .01$). Also almost all the variables of KMES have a good standardized loading (> 0.657 and $p < .01$) except KME2. This implies that KME2 is not contributing much to the variations in KMES. It can also be observed that the standardized regression weight between KMAI and KMES is 1.018, which is an indication of strong positive relationship between them.

In terms of the research and recommendation of Hau et al. (2004), the researchers selected goodness of fit indicators like χ^2, GFI, RMSEA to examine the degree of model fit. During these indicators, it's better for Chi-square test not to reach significance. But the value of Chi-square is easily influenced by sample size. If the sample size is large, the value is easy to reach significance. CFI is a goodness of fit index with many strong points, which has less impact from sample size. Even though RMSEA is also influenced by sample size, it is insensitive to the misspecification model with few parameters, so it is also rarely influenced by sample size, the smaller the value of RMSEA is, and the fitter the model is. The results of the above conceptual model shows the Chi-square value of 92.468, with p =.000, GFI = 0.966; AGFI = 0.936; CFI = 0.984, and RMSEA = 0.064. The values of the goodness of fit indexes suggest the norms of a reasonably high-fitting model are fully satisfied.



CHI-SQ=92.468; DF=29; P-.000; GFI=.966; RMSEA=.064

Fig. 2. KMAI and KMES model

Table 16: Estimates of coefficients of KMAI and KMES variables

Variables			*Unstandardized estimate*	*Standard error*	*C.R.*	*P*	*Standardized estimate*	R^2	*Standardized regression weight*
KM1	<—-	KMAI	0.904	0.042	21.661	<.001	0.779	0.607	
KM2	<—-	KMAI	0.945	0.042	22.405	<.001	0.796	0.634	
KM3	<—-	KMAI	0.993	0.043	23.216	<.001	0.814	0.662	KMAI –
KM4	<—-	KMAI	0.995	0.042	23.614	<.001	0.820	0.672	KMES
KM5	<—-	KMAI	1.000	0.043	22.309	<.001	0.791	0.626	1.018
KM6	<—-	KMAI	1.000	-	-		0.850	0.722	
KME1	<—-	KMES	1.244	0.074	16.811	<.001	0.824	0.679	
KME2	<—-	KMES	0.774	0.079	9.846	<.001	0.402	0.161	
KME3	<—-	KMES	1.072	0.056	19.151	<.001	0.736	0.542	
KME4	<—-	KMES	1.000	—-	—-		0.657	0.431	

Source: Computed from primary data

However, on visual examination of the factor loadings and corresponding values of R^2 of the individual variables reveal that the variable KME2 does not satisfy the condition of factor loadings and hence may not contribute to the total variance of the respective factors though they are statistically significant ($p < .01$). This variable KME2 with the least R^2 value 0.161 has been removed from the analysis and the following modified structural model was validated again with the resulting variables are presented in Table 17.

The results depicted in Table 17 indicates the GFI value of .979, AGFI value of 0.957, CFI value of 0.992 and RMSEA value of 0.050 conform to the norms of a high-fitting model. The model was tested for validity with KMES as independent variable and KMAI as dependent variable with the following hypotheses.

***H_0*:** There is no impact of KMES on KMAI.

***H_1*:** There is a significant impact of KMES on KMAI.

It can be observed from the above model that there is a significant relationship within the KMES variables – KME3 and KME4 (0.40). Also significant relationships within KMAI factors can be noticed from the above model, between KM1 and KM2 (0.44), KM2 and KM3 (0.33) and between KM1 and KM3 (0.28).

Table 18 gives the unstandardized and standardized estimates of various regression models and their significance involved in the structural model.

It can be seen from the Table 18 that all the variables of KMAI have standardized loading above 0.7 thus contributing to the variations in Knowledge Management Assessment Instrument ($p < .01$). Also all the variables of KMES have a good standardized loading (> 0.648 and $p < .01$). It can also be observed that the standardized regression weight between KMAI and KMES is 1.024, which is an indication of strong positive relationship between them. This indicates that when KMES goes up by 1 standard deviation, KMAI goes up by 1.024 standard deviations. The hypothesis set in the model was tested for validity and the result is reproduced in Table 19.

It can be observed from the Table 19 that a very low p-value (< .001) for the impact of KMES (Knowledge Management Enablers Scale) on KMAI (Knowledge Management Assessment Instrument) factors verify that the hypotheses is rejected at one percent level of significance and it is concluded that there is a strong positive impact of KMES factors on KMAI factors and higher educational institutions are ready to implement the knowledge management practices successfully. Allameh et al. (2011) studied the relationship between KM enablers and KM processes. They had developed separate regres-

Table 17: Results of the structural model

Chi-square	*Df*	*P*	*CMIN/df*	*GFI*	*AGFI*	*CFI*	*RMSEA*
51.576	22	.000	2.344	.979	.957	.992	.050

Source: Computed from primary data

Table 18: Estimates of regression models

Variables			*Unstandardized estimate*	*Standard error*	*C.R.*	*P*	*Standardized estimate*	*R^2*	*Standardized regression weight*
KM1	<—-	KMAI	0.904	0.042	21.513	<.001	0.778	0.605	
KM2	<—-	KMAI	0.945	0.042	22.233	<.001	0.794	0.631	
KM3	<—-	KMAI	0.993	0.043	22.948	<.001	0.731	0.656	KMES–
KM4	<—-	KMAI	1.004	0.043	23.538	<.001	0.821	0.673	KMAI
KM5	<—-	KMAI	0.962	0.043	22.461	<.001	0.797	0.635	1.024
KM6	<—-	KMAI	1.000	—-	—-		0.848	0.718	
KME1	<—-	KMES	1.250	0.075	16.565	<.001	0.821	0.675	
KME3	<—-	KMES	1.072	0.056	19.295	<.001	0.731	0.535	
KME4	<—-	KMES	1.000	—-	—-		0.648	0.420	

Source: Computed from primary data

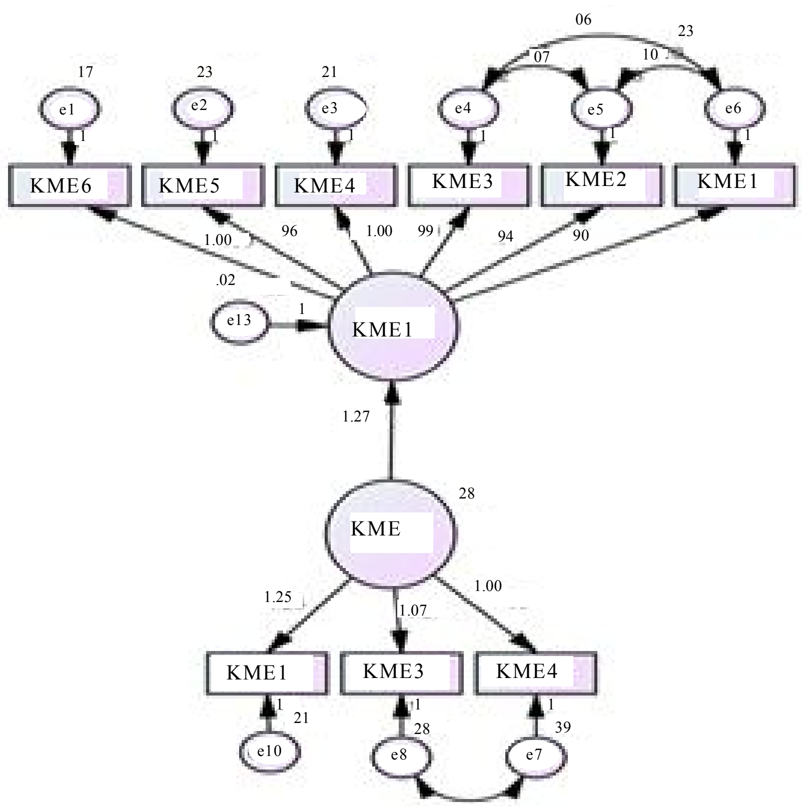
S.E. - Standard error; C.R- Critical Ratio; P - Probability value; R^2- R-squared;

Table 19: Hypothesis testing of factors in the model

Variables			*Hypothesis*	*P*	*Inference*
KMAI	<—-	KMES	There is no impact of KMES on KMAI.	.000	Rejected

Source: Computed from primary data

sion models for KM process variables knowledge creation, capture, organization, storage, dissemination and application treating KM enablers – technology, structure and culture as independent variables and established that technology and culture have the most effect on the knowledge management processes. But, however, they had not studied the inter-relationships between the independent variables. Through this research, the author examined the inter-relationship between the independent variables that there is a strong positive correlation between the KME3 (Collaboration) and KME4 (Trust) and also between KME1 (Technology) and KME3 (Collaboration); there is a moderate positive correlation between KME1 (Technology) and KME4 (Trust). Further, it was found that there is a strong positive impact of KM enablers on KM process and also KME1 (Technology), KME3 (Collaboration) and KME4 (Trust) have a significant impact on KM process variables (Fig. 3). These findings establish the results of Allameh et al. (2011).These relations confirm the significant impact of KM enablers on KM processes. Therefore it is recommended to improve enabling factors in the organization in order to enhance the knowledge management processes. The same results have been established by



CHI-SQ=51.576; DF=22; P-.000; GFI=.979; RMSEA=.050

Fig. 3. Modified structural model

Lee (2017) through his research in hospital organizations. Moreover, the findings of the present research match with the findings of the research of Magnier-Watanabe et al. (2011).

CONCLUSION

The present research provides a unique perspective of KM readiness in higher learning institutions in India, which is not much covered in the KM literature. The academic institutions readiness for implementing the KM has been examined with the help of faculty members' opinion on Creating knowledge, Capturing knowledge, Organizing knowledge, Storing knowledge, Disseminating knowledge and Applying knowledge for effective implementation of KM practices in academic institutions. Before implementing the KM in academic institutions, the management should involve in significant amount of pre-arrangement of knowledge management enablers such as Organizational Structure, Technology, Collaboration and Trust in such a way the implementation knowledge management will be successful in higher educational institutions.

RECOMMENDATIONS

Knowledge Management in higher education institutions supports many aspects of college-level teaching, learning, and administration. Hence, educational institution managements should concentrate on effective implementation of KM in academic institutions. KM enablers are the critical success factors of KM implementation in HEIs. The trust and collaboration have predominant role in knowledge sharing culture among the faculty members; therefore, the management should create trust and loyalty among the faculty members which provide suitable environment for effective knowledge sharing. The success of KM practices is mainly depending on effective utilization of information and communication technologies. The faculty members should be familiarized with the use of modern technologies. Knowledge hub and knowledge network can be established locally which are enabling the academic institutions to share the research output, laboratory facilities and mentoring support from subject experts and researchers.

FOR FUTURE STUDIES

For higher educational institutions, the present paper offers a purposeful opportunity to further investigate the impact of knowledge management practices for academic excellence in the present competitive scenario. The Academic institutions that are interested in examining this issue further may extend our research in many directions. For practitioners and policy makers, our research may serve as a guiding force to motivate them to implement KM practices in all the accredited educational institutions for maintaining the quality parameters in a successful way.

LIMITATIONS

The present research has been carried out in the higher educational institutions in Namakkal district, Tamil Nadu, India. The sample size of the present research is limited and hence proper care should be taken when generalizing the findings of this study. Further, the present study includes samples only from faculty members working in the higher educational institutions in the study area. Hence, in future, studies must attempt to broaden the scope by including the administrators, top level management of higher educational institutions.

ACKNOWLEDGEMENTS

The researchers are very much thankful to the Principals, Directors, and Heads of the Departments of the higher educational institutions in Namakkal District, Tami Nadu India for permitting their faculty members to participate in the survey and contribute their viewpoints towards the this research.

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Paper received for publication on Novmber 2017
Paper accepted for publication on December 2017