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KNOWLEDGE MANAGEMENT COMPONENTS IN INDIAN HIGHER EDUCATION SELF-FINANCING MANAGEMENT INSTITUTIONS – A HIERARCHY APPROACH

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Abstract *The role that knowledge management systems (KMS) play in facilitating better decision-making and providing sustainable competitive advantages for organizations has been recognized worldwide. Academic sector has significant opportunities to apply KMS practices to supplement their mission and achieve their vision. The study investigates the concept of KMS in a higher education institution by adopting a hierarchical approach. Components of knowledge management (KM) such as awareness, existence, future, and benefits have been identified. The analytical hierarchical process method has been applied to prioritize the relative importance of three components out of these, that is, awareness, existing status, and future implications of KM to higher education. The paper is based upon a quantitative and qualitative study. The outcomes of the paper describe that there is awareness and existence of KM in higher education management institutions in an Indian perspective. However, future implications are supposed to be relooked at for the better implementation of the concept.*

Keywords: *Knowledge, Knowledge Management (KM), Higher Education (HE), Management, Institutions, Self-Financed, Awareness, Existence, Analytical Hierarchical Process (AHP)*

Introduction

The higher education sector in India is undergoing a great revolution in the present economy. Indian universities lack far behind in competing with global universities despite the fact that India has a huge population of private- and state-run universities and schools. A recent survey by the Associated Chambers of Commerce and Industry of India states that over 180 management colleges had closed down in 2012, and barely 10% of the students graduating from these colleges were found employable. According to a study conducted by the NAAC in 2010, over 90% of colleges and 62% of universities are average or below average.

The role that the knowledge management system (KMS) plays in facilitating decision-making and providing sustainable competitive advantages for organizations has been realized worldwide (Stankosky, 2005). Hence, it can be presumed that knowledge management (KM) can be successfully applied to the academic sector to achieve their mission and vision. Practicing KM concepts can lead higher education management institutions to explore and hence appreciate how KMS might be applied in higher education institutions' (HEI) setting (Petrides & Guiney, 2002; Petrides & Nodine, 2003). Academic institutions use information technology-based tools for admissions, registrations, time-table processing, and performance evaluations of their faculty, students, and staff. If they move a step ahead and rope in the KM practices, along with information technology tools and techniques, they can have a proper KMS in place (Kumar & Kumar, 2006; Ruber, 2000). The technology can act as a perfect catalyst in knowledge capturing, sharing, and creation process.

Knowledge is a strategic resource for an organization and provides sustainable competitive advantage. Managing this knowledge becomes an important objective for an organization. Making knowledge available to the right people at the right time is crucial for building and sustaining an organization's competencies. Knowledge-based competitive

advantage is sustainable because learning is indispensable and, hence, the limit to knowledge creation. LM plays an important role in the improvement of organizational competitive advantage through sharing of best practices, achieving better decision-making, and faster response to key institutional issues, better process handling, and improved people skills. This means less reinvention of the wheel, relevant, and focused policies in compliance with institutional goals and objectives, the ability to access information more quickly, improved academic and administrative services, reduced costs, and prevention of mistakes and failures (Ranjan & Bhushry, 2011). The benefits of the use of KM method in higher education can be classified into five main categories, such as the benefits on the research process, the curriculum development processes, student and alumni services, administrative services, and strategic planning (Kidwell, Vander Linder, & Johnson, 2000).

The academic industry, though far behind the commercial industry, is a prolific ground for reaping KM benefits. KM refers to a range of practices used by organizations to identify the higher levels of innovations. KM can help institutions to ensure that the right information reaches the right people at the right time to take the right decisions, using a successfully implemented KMS, which is crucial for building and sustaining an organization's competencies. According to Sharma and Kaur (2016), the educational institutions hold the prime responsibility of effective creation and successful dissemination of the knowledge. It is viewed that the KM practices have greater application to the educational institutions. There are several reasons for applying KM in institutions of higher education, most important ones being – need for knowledge sharing, no hesitation for knowledge sharing, and growth by improving the level of information and knowledge sharing (Ranjan & Khalil, 2007).

Laal, M. (2010) outlines and integrates the previous scientific works on KM in higher education by providing an effective and efficient understanding of it for a dynamic environment. In recent times, the high speed of evolution has taken all by stride, and dynamism has prevailed. Survival of the fittest is the key and those who are unable to learn, adapt, and change will simply won't survive. Current HE institutes recognize their valuable intelligences and have adopted their changing role in a society. They is embracing KM principles for the progress of the Education sector.

KMS is now accepted by most of the non-academic organizations as a key for better decision-making and gaining competitive advantages. Applying KM concepts has led HEIs to explore how KM might be applied in a HEI's setting. KMS in HEI could boost the efficiency, effectiveness, and quality of graduates, and make them employable (Ramakrishnan & Yasin, 2012). Each HEI is unique in its scope, size, and priorities, and is a complex institution that balances both providing superior education and research opportunities, while simultaneously operating as an efficient and effective business in a competitive market (Cranfield & Taylor, 2008).

It is presumed that a proposed framework of a KM system and supporting technology will blend the organization's goals, social processes, organization behaviour, and organization strategy with the KM strategy. There will be a unison in the processes of knowledge creation, sharing, or application. It will foster the growth of HEI and promote the primary activities of teaching, learning, and academic administration. To summarize, if a KM portal is properly and implemented (Sinha, Arora & Mishra, 2012), it would improve the institution's performance and productivity. Application of KM practices in HEI will improve the standards of all the institutions, develop the performance of students in all faculties, and facilitate the progress of a nation.

Review of Literature

Knowledge Management in Higher Education

A review of the literature (Fullan, 2001; Kidwell et al.,2000; Kumar & Kumar, 2006; Petrides & Guiney, 2002) indicates that the field of KM has gained popularity in both the business and education arenas, and advances in information technology have served to assist in developing and implementing KM strategies. Information technology plays a major role as without technology most knowledge sharing practices would be less effective (Riege, 2005) .It helps to create, capture, organize, access, and use the intellectual assets of the organization (Coakes, 2006). However, it is important to remember that IT is a vital enabler and the primary driver of a KM or sharing initiative (Coakes, 2006; Tsui, 2005). Thus, the cultural issues are considered as primary and the Information Management issues are considered secondary. Organizing the knowledge of the organization and enabling access to it are critical to employees' ability to effectively use knowledge that is scattered across the organization (Logan, 2006). Hence, the concern is the awareness about the availability of the information and its existence in the desired form.

Previous work on application of KM in academic scenario talks of the steps to develop a framework, the opportunities, and prospects (Sinha et al., 2012). According to Petrides and Nodine (2003) the use of KM method in education enables the encouragement of the greater intelligence, practical

know how, and effectiveness of education institution management. Kumar and Kumar (2005) state the need of IT-based KM initiatives that make a strong case for further exploration with a view to look upon them as potent enablers for restructuring the existing higher education system in India, which may also cast a significant impact on the overall economics of running and maintaining the higher education system in India. Earlier studies (Ranjan & Khalil, 2007) present a conceptual framework in the context of KM in Business Schools (B-schools) in India. The authors have the view that if the framework is adopted in B-schools, it will yield more benefits to increase the quality of knowledge sharing. However, initially, it is important to inquire about the awareness, availability, and existence of knowledge and KM concept among people who would be the end users of the system. It is also important to know whether they see any prospects or future benefits of such a concept and its applicability in the education sector.

Nassuora (2011) states that in the present dynamic economies, it is not only essential to be aware, but it is also equally important to be able to apply and capture what is learned. According to Agarwal et al. (2012), there is a need to facilitate academia with KM-based platform, which can help them design an innovative industry oriented and state-of-art curriculum. A KM-based curriculum development portal design is proposed, which can be leveraged to enhance the curriculum development and thereby breed industry oriented professionals. Munir and Rohendi (2012) develop a prototype of KMS at the Indonesia University of Education and study towards the achievement of KMS to improve the performance of the university. The purpose of this study is to develop a prototype KMS in organizing and documenting the knowledge in the university and do a document aggregation based on the total number, subjects, and writers (lecturers). Bakshi (2013) presents a conceptual framework in the context of KM in education in India. The author suggests that if the framework is adopted in schools, colleges, and HEIs, it yields more benefits to increase the quality of knowledge sharing. The paper presents an academic framework for the adoption of KM principles in educational institutions. Goh and Sandhu (2013) investigate the role of knowledge sharing to help universities to strengthen their research and teaching activities. They discuss that knowledge resides within a human being and it is hard to be transferred to others. Unwillingness to share is one of the main impediments of knowledge sharing. Unwillingness to share leads to absence of existence and lack of awareness. Thus, these issues drive the need to prioritize the dimensions of KM such as awareness, existence, and future.

According to Hasani and Sheikhesmaeili (2016), there is a significant relationship between KM and employee empowerment. In addition, KM predicts the aspects of employee empowerment in institutions of higher education. The study describes the positive role of KM in employee empowerment in institutions of higher education, and the importance of considering such studies has been specified for researchers. Ojo (2016) proposes a conceptual model, which Nigerian universities could adopt in order to drive innovation and performance. This could serve as a basis for empirical investigations on KM processes in universities. The paper concludes that, while KM has the potential for improving performance within universities, the proposed model must be subjected to empirical validation for further amendments and improvements.

According to Abdullah et al. (2016), KM will act as a tool to connect all the university stakeholders such as students, teachers, researchers, business, and external entities, with work processes and technologies. The research provides empirical evidence for understanding of KM practices in HEIs within the context of instable environments, focusing on the unique geopolitical situations. The paper investigates the social phenomenon and asks deep qualitative questions of "why" people look for knowledge, "how" they use this knowledge, and "how" they face the instability of the complicated situation in order to develop a knowledge society.

To summarize, based on the literature review and interactions with academicians, students, and other stakeholders of higher education management institution, several constructs have been identified. These can be listed as awareness of knowledge and KM, the current status of KM practices in terms of enablers and culture, and finally the implication and consequences of such practices among people working in self-financed management educational institutions. Out of all these constructs related to knowledge and KM, the present research selects three components, which are awareness about knowledge and KM, existence of knowledge and KM, and finally the future prospects and benefits of knowledge and KM. The study takes into consideration the three components (Awareness, Existence, and Future) and their sub-components to determine the hierarchy of the three major components. The data are collected based on a questionnaire build upon the components and sub-components and the results are analysed to draw appropriate conclusion.

Methodology

In this study, the KM components such as awareness of knowledge and KM, existence of knowledge and KM, and

the future prospects and benefits of knowledge and KM are identified, and their sub-components are arranged in a hierarchical manner based on their weights. The central purpose of the study is to establish the consistency and priority approaches for adopting KM in a HEI setting and define the hierarchy of the various components and subcomponents involved. The tool used is Analytical Hierarchical Process (AHP). It was found that AHP model has been used with the concept of KM by only few researchers (Ngai et al., 2005; Lee et al., 2011); hence, the motivation for doing this research arrives.

AHP is a hierarchical representation of a system. A hierarchy is an abstraction of the structure of the system, consisting of several levels representing the decomposition of the overall objective to a set of clusters, sub-clusters, and so on down to the final level. Decomposing the complexity of a problem into different levels or components and synthesizing the relations of the components are the underlying concepts of AHP (Cheng & Li, 2001). Saaty (1980) introduced AHP as a multi-criteria decision-making approach to decide the rank order of decision alternative or select an alternative from a set of alternatives based on multiple criteria. Thus, AHP directs how to determine the priority set of alternatives and the relative importance of attributes in a multi-criteria decision-making problems. The primary advantage of this approach is the relative ease with which it handles multiple criteria and performs qualitative and quantitative decision-making (Kahraman et al., 2004; Meade & Sarkis, 1998). AHP addresses the issue of selecting an alternative based on multiple criteria. In this paper, Excel solver has been used to perform various calculations, although Expert Choice 2000, a software is also available to arrange the criteria and sub-criteria, measure them using pairwise comparison and combine them to arrive at a prioritize list of alternatives.

Following are the steps for implementing AHP:

Step 1: To develop an AHP model, the objective, the main components, and sub-components are identified. This is followed by the decision-makers doing pair-wise comparisons between decision alternatives and criteria using a nine point scale (Refer Table 1). All matrices are developed and all pair-wise comparison is obtained for each n-decisions makers.

Step 2: Then, the consistency is calculated to ensure that the priority element is consistent and the maximum eigenvector or relative weights and maximum is calculated. Then the consistency index (CI) for each matrix order *n* is computed by using Equation (1). On behalf of CI and the random index (RI) the consistency ratio is calculated from equation.

$$C.I. = \frac{\lambda_{max} - n}{n-1} \quad (1)$$

And

$$C.R. = \frac{C.I.}{R.I.} \quad (2)$$

Table 1: Random Index Values for the Comparison of *n* Items

N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
R.I.	0	0	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.49	1.51	1.48	1.56	1.57	1.58

The Development of the AHP Model

In developing an AHP model, first decision-makers provide weighted preferences for the criteria that are used to determine the preferences for the precision alternatives. Secondly, AHP rates each alternative using each criterion. Finally, AHP will develop a prioritized ranking of the decision alternatives based on the relative importance placed on each criterion as well as the ratings of each alternative on each criterion. Ngai et al. (2005) have studied the use of AHP to select a suitable tool to support KM. The multi-criteria approach is used to analyse and compare available KM tools. An AHP model is formulated and applied to a particular case and hence evaluated to prove its efficacy. Lee et al. (2011) has used AHP to quantify the important KM behaviours (Transfer, Sharing, and Creation) and analyse the weighted scores. The study identifies the weight scores of four important knowledge-transfer behaviours, three knowledge-sharing behaviours, and four knowledge-creation behaviours.

Define the Problem and the Goal

The AHP model development gives way to the hierarchical structure of the problem. The highest level of the hierarchy reflects the main goal (i.e., to arrange the KM components awareness, existence, and future in order of priority). The lower levels decide the priority of the sub-components among each group of components. Figure 1 depicts the hierarchy of the AHP model for KM components in self-financed HEI.

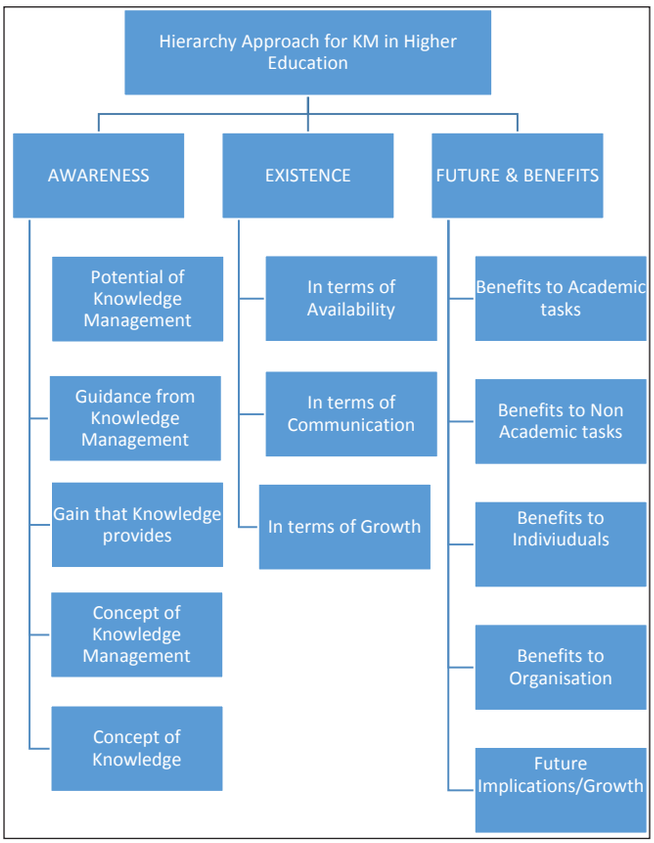

Fig. 1: The Hierarchical Approach to KM Components

Identification of the Criteria for Evaluation-Selecting Factors for the Model

For formulating the AHP model, it is important to note the three factors that have been considered significant for studying the importance of KM in self-financing higher education management institutions: namely awareness, existence, and future & benefits. Through detailed analysis of the literature and in-depth interviews with the faculty and staff members, the three essential components were identified, along with their attributes.

1. Awareness

For anything to be acceptable, it is important for it to be recognized. Hence, this KM component covers the know-how and knows-why of KM. It is simply the familiarity that is available about the meaning and concept of knowledge and KM among academic and non-academic staff members in higher education management institution. It covers criteria such as gain that knowledge provides (guidance for action and framework for new experiences and information), the potential of knowledge and KM, what it is, and what it is not.

2. Existence

Existence refers to the features that display the availability of the component. Existence of knowledge can be in two forms: in terms of enablers and in terms of culture. Existence of KM in terms of enablers can be experienced by availability of timely and accurate information and the drivers for facilitating the availability (recognition/incentives). Existence in terms of culture can prevail by the availability of a collaborative sharing culture and procedures for communication flows. Growing existence can happen when social media and new technology are being harnesses and continuous strive for learning, unlearning, and relearning exists.

3. Future & Benefits

The future prospects and the benefits are very important when discussing the KM concept in higher education. KM can be helpful academic arena by enriching student learning, enhancing collaboration among faculty and students, research and development initiatives, personal development of individuals, etc. Benefits are also foreseen in non-academic task such as planning and promoting communication. Benefits to individuals like facilitating decision-making, reducing mistakes, delegating authority and accountability, and promoting individual learning. Benefits to organisation such as promoting team work, Staff retention and improving the academic and administrative processes. Finally, the future prospects such as creation of alliances with international partners, popularity of the institution (becoming a brand), and developing competitive advantage.

Designing the Questionnaire

The questionnaire used for this research was procured from a previous research by the same authors using factor analysis. It incorporated questions querying responses on a five-point Likert scale. Utilizing the same primary data, a quantification of responses has been done on a nine-point scale, segregating the questions under the three headings/components: awareness, existence, and future-related approaches. In case of awareness, out of 10 parameters, five have been eliminated and rest five have been considered for analysis. Whereas in case of existence, out of eight parameters, five are eliminated and rest three have been considered. In case of Future, five components are chosen out of 19, so 14 are eliminated.

All these extracted items have been reanalysed and put under the three headings of awareness, existence and future. The survey was distributed to a sample of academicians working across several institutes in North India. However, 40 questionnaires were incompletely filled, which rendered them unusable and 170 were complete and used for data evaluation representing 81% response rate. It was about 6 months after posting the survey when the 170 responses received were analysed. According to past studies on development and validation of critical factors and environmental management, its response rate is 21.9% (Wee & Quazi, 2005) further more Antony et al. (2002) also pointed out that their research got 16.5%, which was normal. This implies that the response rate of this study is acceptable.

Comparative Judgments to Establish the Priorities

After summarizing the data from the questionnaire, the priorities were developed by assigning weights through the process of pairwise comparison. This process incorporates the comparison of one objective to the other in terms of relative importance. This was done by verbal comparison in this paper although it can also be done by software such as Expert choice. The verbal comparisons are compared for their relative importance using the words, which quantify them on a relative nine-point scale.

Reliability and validity of these components need to be checked because as reliability concerns the extent to which an experienced test or any other measuring producer yields the same results on repeated variables (Carmines & Zeller, 1970). The reliability of the factor need to be determined to support any measures of validity that may be employed (Nunnally, 1978). Internally to the consistency analysis was performed to measures the reliability of the items under each sections using Cronbach's alpha (Wee and Srazi 2005) which is listed in the table showing extracted results all the cronbach alpha values for our three sections greater than 0.7 describing the high internal consistency, as the content validity depends on how the researchescreate measurement items to cover the content domain of the variables named (Nunnally 1967).

Results and Findings

Determining the Normalized Weights

To determine the relative importance Knowledge Components and approaches groups of pair wise comparison matrixes was translated into the Eigen vectors problems and then were normalized to symmetries the results so as to acquire the vectors of priorities. The geometric mean is utilized to aggregate the pair wise comparisons for all the samples. Solver generated the normalized local weights of the components and approaches and results are mentioned as per table. The Global weight of each approach is then achieved by multiplying the local weight of component by local weight of respective approach. If we analyse the local weights of each component, awareness is the component having highest priority with global weight of (.676772) followed by existence (.192497) and future (0.130731).

- For the component awareness, if we visualize the abstracted five approaches, as per hierarchy potential of KM is the most important awareness component (0.435293) followed by guidance from KM 0.296126), gain that knowledge provides (0.133681), concept of KM (0.090803) and concept of knowledge (0.044096). this reflects that KM potential exists but lack of appropriate concept pulls it back in creating awareness about the same.
- For the Existence component, which has three sub components , the most important sub component occurs in terms of availability of KM(0.532143),followed by communication of KM (0.366071), and growth of KM (0.101786).
- For the component Future of KM, the sub component, benefits to organisation is placed at highest position with weight (0.299283), followed by Benefits to non-academic tasks (0.21076), Benefits to individuals (0.204335), Benefits to Academic tasks (0.198444) and Future growth (0.087178) in descending order of weights.
- According to Table 4, if the column Global weight is considered with respect to column Overall rank, the sub-component Existence in terms of availability takes highest position with weight (1.15867) and future growth takes least important position with weight (0.021265). Hence, it can be concluded by the author that KM exists in form of availability and communication, as well as it has potential also but future growth is not visible as per the present outcomes .The overall hierarchy of each sub component summarized from 3 main components has been elaborated in table 4 in form of overall ranking as well as in form of chart as shown in chart 1.

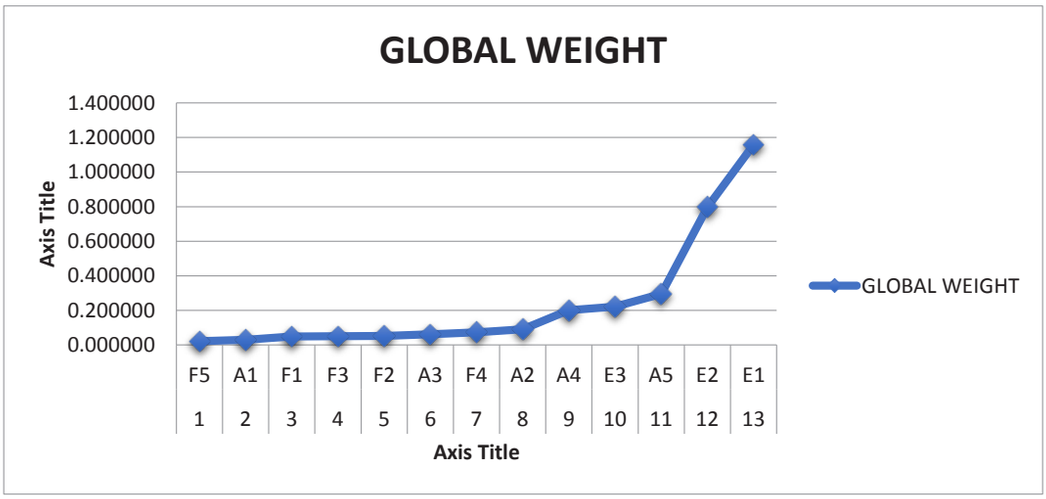

Chart 1: Global Weights on Individual Approach in Ascending Approach for all Three Component

Table 2: Global Weights Ranked for All Components (In Ascending Order)

Rank	Approach	Global Weight
1	F5	0.021265
2	A1	0.029843
3	F1	0.048406
4	F3	0.049843
5	F2	0.051410
6	A3	0.061453
7	F4	0.073003
8	A2	0.090471
9	A4	0.200410
10	E3	0.221626
11	A5	0.294594
12	E2	0.797077
13	E1	1.158678

Conclusion and Future Scope

From the results obtained by the study, the conclusive highlights of this research paper can be elaborated through following points:

- For the KM components, the consistency ratio is 0.082385325, which is adequate to describe the consistency among the three components Awareness, Existence and Future.
- After doing the pairwise comparison, the consistency ratio for Awareness and Existence is respectively 0.085195117 and 0.081704, which elaborates that sub components of awareness and existence are consistent; however, consistency ratio for future-related approaches is coming to be 0.932808. As per standards, the consistency ratio should not exceed 0.1; hence, it is being concluded by the author that sub components of the component future are not in consistency of each other.
- Summarising the above second point, it is being resulted by the author, that hierarchy of KM future-related sub components should be rearranged for better results or some more correlated sub components should be included under heading future.
- Though the constructs of the study have been considered after existence review of related literature, changing the hierarchy of sub components may further vary the results as per the conditions of executing KM in a specific organisation or a specific country.

Table 3: Local and Global Weight of Each Component and Respective Approach in Section

KM Components	Sub Components of Km Components	Abbre-viations	CronBach Alpha	Local Weight Common	Local Weight Individual	Global Weight	Rank	Overall Rank
Awareness	Concept Of Knowledge	A1	0.859	0.676772	0.044096	0.029843	1	2
	Gain That Knowledge Provides	A2			0.133681	0.090471	3	8
	Concept Of Knowledge Man-agement	A3			0.090803	0.061453	2	6
	Guidance From Knowledge Management	A4			0.296126	0.20041	4	9
	Potential Of Knowledge Management	A5			0.435293	0.294594	5	11
Existence	In Terms Of Availability	E1	0.870	0.192497	0.532143	1.158678	3	13
	In Terms Of Communication	E2			0.366071	0.797077	2	12
	In Terms Of Growth	E3			0.101786	0.221626	1	10
Future	Benefits To Academic Tasks	F1	0.937	0.130731	0.198444	0.048406	2	3
	Benefits To Non Academic Tasks	F2			0.21076	0.05141	4	5
	Benefits To Individuals	F3			0.204335	0.049843	3	4
	Benefits To Organisation	F4			0.299283	0.073003	5	7
	Future Implications/ Growth	F5			0.087178	0.021265	1	1

Table 4: Pair-Wise Comparison Matrix and Weights with Respect to Components

Components Of Km	Awareness	Existence	Future	Average %
AWARENESS	1	5.00	4	0.676772
EXISTENCE	0.2	1.00	2	0.192497
FUTURE	0.25	0.50	1	0.130731

LAMBDA = 3.095566977, CI = 0.047783488, CR = 0.082385325

Table 5: Pair Wise Comparison Matrix and Weights for Awareness Related Approaches

	a1	a2	a3	a4	a5	Average %
a1	1	0.20	0.25	0.2	0.166667	0.044096
a2	5	1.00	2.00	0.333333	0.2	0.133681
a3	4	0.50	1.00	0.166667	0.2	0.090803
a4	5	3.00	6.00	1	0.5	0.296126
a5	6	5.00	5.00	2	1	0.435293

LAMBDA = 5.381674123, CI = 0.095418531, CR = 0.085195117

Table 6: Pair Wise Comparison Matrix and Weight for Existence Related Approaches

	e1	e2	e3	Average %
e1	0.571429	0.63	0.4	0.532143
e2	0.285714	0.31	0.5	0.366071
e3	0.142857	0.06	0.1	0.101786
	1	1	1	1

LAMBDA = 3.094776, CI = 0.047388, CR = 0.081704

Table 7: Pair-Wise Comparison Matrix between Future Related Approaches

	f1	f2	f3	f4	f5	Average %
f1	1	2.00	7.00	0.2	0.333333	0.198444
f2	0.5	1.00	0.25	3	4	0.21076
f3	0.142857	4.00	1.00	0.25	7	0.204335
f4	5	0.33	4.00	1	8	0.299283
f5	3	0.25	0.14	0.142857	1	0.087178

LAMBDA = 9.178979, CI = 1.044745, CR = 0.932808

References

Almudallal, A. W., Muktar, S. N., & Bakri, N. (2016), Knowledge management in the Palestinian higher education: A research agenda. *International Review of Management and Marketing, 6*(S4), 91-100.

Agarwal, S., Sharma, P. B., & Kumar, M. (2008), Knowledge Management Framework for improving Curriculum Development Processes in Technical Education, Third 2008 International Conference on Convergence and Hybrid Information Technology, IEEE Xplore.

Agarwal, P. D., Kiran, R., & Verma, A. K. (2012). Knowledge sharing for stimulating learning environment in institutions of higher technical education. *African Journal of Business Management, 6*(16), 5533-5542.

Nassuora, A. B. (2011). Knowledge sharing in institutions of higher learning. *American Academic & Scholarly Research Journal, 1*(1), November 2011. Retrieved from www.aasrc.org/aasrj

Bakshi, R. (2013). Sharing and connecting knowledge in indian educational institutions through knowledge management. *International Journal of Behavioral Social and Movement Sciences, 2*(1).

Mishra, B., & Bhaskar, A. U. (2011). Knowledge management process in two learning organisations. *Journal of Knowledge Management, 15*(2), 344-359.

Cheng, E. W. L., & Li, H. (2001). Analytic hierarchy process: An approach to determine measures for business performance. *Measuring Business Excellence, 5*(3), 30-36.

Coakes, E. (2006). Storing and sharing knowledge. Supporting the management of knowledge made explicit in transnational organizations. *The Learning Organization, 13*(6), 579-593.

Cranfield, D. J., & Taylor, J. (2008). Knowledge management and higher education: A UK case study. *The Electronic Journal of Knowledge Management, 6*(2), 85-100. Retrieved from www.ejkm.com.

Fullan, M. (2001). *Leading in a culture of change: Being effective in complextimes.* San Francisco, CA: Jossey-Bass.

Goh, S. K., & Sandhu, M. S. (2013). Knowledge sharing among Malaysian academics: Influence of affective commitment and trust. *The Electronic Journal of Knowledge Management, 11*(1), 38-48. Retrieved from www.ejkm.com

Kahraman, C., Cebeci, U., & Ruan, D. (2004). Multi-attribute comparison of catering service companies using fuzzy AHP: The case of Turkey. *Int. J. Prod. Econ., 87.*

Hasani, K., & Sheikhesmaeili, S. (2016). Knowledge management and employee empowerment: A study of higher education institutions. *Kybernetes, 45*(2), 337-355. doi: 10.1108/K-04-2014-0077

Kidwell, J. J., Vander Linder, K., & Johnson, S. L. (2000). Applying corporate knowledge management practices in higher education. *Educause Quarterly*, (4), 28-33

Kumar, A., & Kumar, A. (2005). IT based KM for institutions of higher education: A need university news. *A weekly Journal of Higher Education in India from Association of Indian Universities,* New Delhi India, *43*(30) 4-9.

Kumar, A., & Kumar, A. (2006). IT based KM In Indian higher education system: Addressing quality concerns and setting the priorities right. *Journal of Knowledge Management Practice, 7*(3).

Logan, D. (2006a). Knowledge Management is Critical to Organizing and Accessing a Company's Intellectual Assets. Retrieved from http://www.gartner.com

Logan, D. (2006b). Using Technology to Create and capture knowledge. Retrieved from www.gartner.com

Meade, L., & Sarkis, J. (1998). Strategic analysis of logistics and supply chain management systems using analytic network process. *Trans. Res., 34*(3), 201-215.

Rohendi, M., & Rohendi, D. (2012). Development model for Knowledge Management System (KMS) to improve university's performance (Case studies in Indonesia University of education). *International Journal of Computer Science Issues, 9*(1).

Ojo, A. (2016). Knowledge management in Nigerian universities: A conceptual model. Interdisciplinary *Journal of Information, Knowledge, and Management, 11,* 331-345. Retrieved from http://www.informingscience.org/Publications/3607

Petrides, L. A., & Guiney, S. Z. (2002). Knowledge management for school leaders: an ecological framework for thinking schools. *Teachers College Record, 104*(8).

Petrides, L. A., & Nodine, R. T. (2003). *Knowledge management in education: Defining the landscape.* The Institution for the study of knowledge management in education Press, USA.

Ranjan, J., & Bhshry, M. (2011) Implementing knowledge management in higher educational institutions in India: A conceptual framework. *International Journal of Computer Applications, 29*(1).

Ranjan, J., & Khalil, S. (2007). Application of knowledge management in management education: A conceptual framework. *Journal of Theoretical and Applied Information Technology,* 15-25.

Riege, A. (2005). Three dozen knowledge-sharing barriers managers must consider. *Journal of Knowledge Management, 9*(3), 18-35.

Saaty, T. L. (2000). *Fundamentals of decision making and priority theory with the AHP* (2nd ed.). RWS, Pittsburg PA.

Serban, A. M., & Luan, J. (2002). Overview of knowledge management, new directions for institutional research. Wiley Periodicals, Inc, No. 113.

Sharma, M., & Kaur, M. (2016). Knowledge management in higher education institutions. *IRA-International Journal of Management & Social Sciences* (ISSN 2455-2267), *4*(3), 548-555. doi:http://dx.doi.org/10.21013/jmss.v4.n3.p4

Sinha, P., Arora, M., & Mishra, N. M. (2012). Framework for a Knowledge Management Platform in Higher Education Institutions. *International Journal of Soft Computing and Engineering (IJSCE), 2*(4), September .

Tsui, E. (2005). The role of IT in KM: Where are we now and where are we heading? *Journal of Knowledge Management, 9*(1), 3-6.

Sharma, V. (2012). A perceptual study on KM orientation in Indian private engineering institutions. *International Journal of Educational Management, 26*(3), 234-251.

Wei, C. C., Chien, C. F., & Wang, M. J. (2005). An AHP-based approach to ERP system selection. *Int. J. Prod. Econ., 96*(1), 47-62.