

An Exploratory Analysis for Sustainable Knowledge Management System in Higher Educational Institutions

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Abstract—The Higher Educational Institutions (HEIs) of India have been contributing to the knowledge base of the country since independence creating, nurturing & developing knowledgeable graduates, because of the ever expanding population, technology & budget for education, Government of India (GoI) open this sector for private ownerships. The profit margins and subsidies provided by the GoI to this sector, catalyst to many entrepreneurs & businessmen, who abruptly jump into this sector, without understanding the know-how of producing knowledgeable graduates. It is the only sector where knowledge is produced in abundance and at faster pace that too in all fields, which make it difficult to manage but it is beyond truth that these institutions are not aware of the importance of managing knowledge although they are more concern with market conditions and competition. Consequently, many institutions were shut down or removed the courses because of less/no enrollment. The HEIs are the hub of knowledge torrents, but still there is limited discussion about how Knowledge Management (KM) should apply in HEIs, and what will be its measuring tool. Thus, a well-tested KMS is required which can manage the relevant organizational, academic and intellectual knowledge. The article explores the appropriate KMS model and its application in one of the private college of India, which is facing fierce competition, and dropping student enrollment. The present model is multi-perspective in approach and can be leverage for other HEIs, although to prove the validity of this KMS model more tests and investigations will be required.

Keywords: KMS, Knowledge Management, Higher Education

1. INTRODUCTION

It is true that accumulation, utilization and transfer of knowledge is practiced by humans since time immemorial, thus, it is not a new concept although with the advent of technology and moreover with web technology, it is becoming cumbersome to tame and control the torrents of knowledge which are produced in abundance and at faster pace in any time in the history of mankind. Beyond doubt, the web technology is having a major impact on the practice of data mining and knowledge management [10]. Knowledge is what is known, and many businesses face crises because they not able to understand the complex nature of knowledge utilization, and that too when knowledge is produced in

abundance and at faster pace due to technologies as a consequence they are not able to tame knowledge they are only interested in making quick money. Moreover, the private HEIs are more prone to inside inefficiency, and miscalculations, due to lack of Knowledge Management System (KMS). Although they have all resources to develop sustainable KMS and can beat their competitors, with the knowledge edge. The knowledge has long been recognized as a valuable resource for organizational growth and sustained competitive advantage, especially for organizations competing in an uncertain environment [14]. The private owned HEIs in India are working in one of the most uncertain environment, where students are in abundance, job market is volatile, competitors are investing huge amount for infrastructure, and talented employees (faculty members) are in great demand, thus, faculty turnover is high. The Higher Educational Institutions same like other businesses also faces the rising challenges of standardized testing, strained budgets, quality product, teacher (employee) retention, global workforce competition, brand and customers (students) expansion [9]. To deal with the fierce competition, the management of these HEIs has to develop or customize, well-tested and sustainable KMS framework to enhance quality performance and competitive edge. Knowledge Management in HEIs helps them to utilize the collective information and created knowledge effectively and efficiently.

The principal aim of this paper is to explore and emphasize the need for knowledge management system in HEIs. The first two sections discuss the literature review in KM theory and its role in HEIs followed by exploring the conceptual model in higher educational institutions.. The authors also discuss the case of implementing KMS and justifying it through two surveys one pre implementation of KMS and other post implementation of KMS model. Eventually, survey results were observed and identifies the implementation KMS framework in applying KM with relevant measurable indicators. Last section presents summary and references

2. RESEARCH METHODOLOGY

The methodology used in this paper is literature review, conversation with KM experts, academicians, constituents of the college, data from the college and surveys through questionnaire. The study size comprises of 500 students & staff of MBA and B.Tech., courses. The data is analyzed through descriptive mean score of all 10 domains and t-test is used to test the difference between two academic years mean scores, and level of significance ($\alpha=0.05$) for all statistical tests. This model is multi-perspective in approach and can be leverage for other HEIs, although to prove the validity of this KMS model more tests and investigations will be required.

3. LITERATURE REVIEW

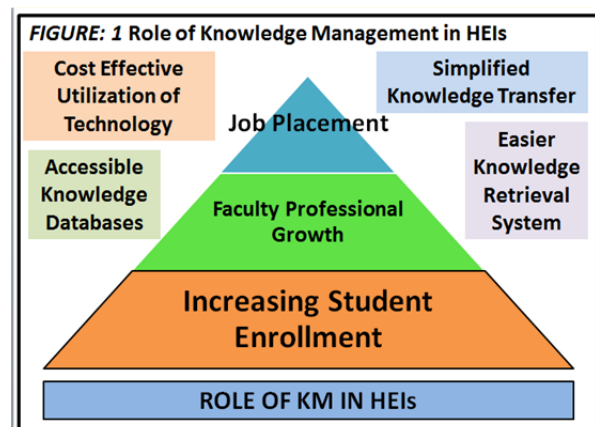
Knowledge refers to the ideas or understandings that an entity creates and/or possesses that are used to take effective action to achieve the entity's goals. In this respect knowledge is divided into the concept of explicit and tacit knowledge [16]. Explicit knowledge is the knowledge that can be written down and preserved into databases, codified, and archived whenever required by the institution. On the other hand, the Tacit knowledge represents knowledge that cannot be written down, this kind of knowledge developed with experience and present in employee's mind and it is difficult to transfer. The explicit and tacit knowledge are the intangible assets of the institution, if organized and utilize properly it can provide excellent service to their customers.

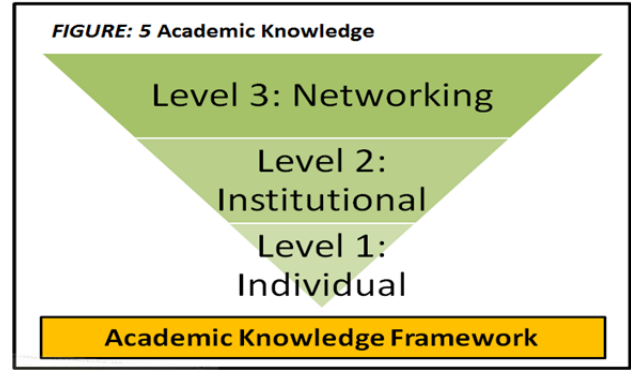
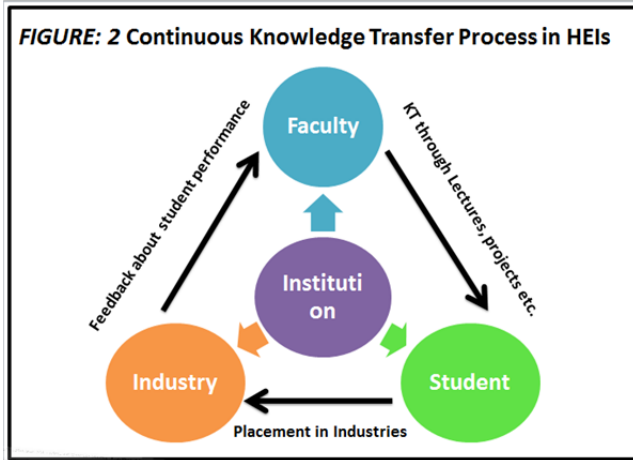
It is true that various valuable result oriented research has been conducted in the field of KM leveraging HEIs, since research is an ongoing process and new value added contributions are piling the treasure of knowledge management. Since knowledge management is not a new terminology anymore. It is old and has been studied by academicians, Philosophers and practiced for decades, however knowledge management concept has come into the picture in the starting of nineteen century. In the 21st century knowledge is important for all the business fields [15]. Knowledge management is the practice of harnessing and exploiting intellectual capital in order to gain competitive advantage and customer commitment through efficiency, innovation and effective decision-making. Both the ideas of knowledge worker [5] and expert labor [8] justified that knowledge management is important to any organization. The knowledge management system is the framework of an integration of organizational elements in organizational culture, organizational information technology, infrastructure and the organization's store of individual and collective experiences, learning, insights, values, etc. [2]. Members can effectively accomplish organizational goals through knowledge management processes and procedures [24]. A firm that effectively manages knowledge is likely to be considered a learning organization [13]. Knowledge dissemination and responsiveness to knowledge are cited repeatedly as the most effective way to a competitive

advantage [17]. While the need for effective managing of knowledge is accepted, much of the literature continues to explore measurement and its effect on outcomes. Only [22] and [3] have developed inventories and clear procedures or methods to measure the effectiveness of such activities. Similarly, the Higher Education Institutions have many challenges in the knowledge economy, renew economic and social systems, extend knowledge and specialist skills, engage effectively in knowledge production, be interconnected with industry, research centers and other institutions, and produce top quality graduates [1] & [12].

4. ROLE OF KM IN HIGHER EDUCATION

It is apparent from the above discussion that knowledge management is a systematic process of gathering, disseminating, applying, renewing and updating the knowledge for achieving companies objectives. The knowledge management has following basic elements i.e. new creation of knowledge, diffusion of knowledge, application of knowledge, culture of the organization, technological tools [20]. These basic tools are the roles of KM to deliver excellence in higher education. One of the important role of KM is, with the emergence of the knowledge based economy where knowledge, competence and related intangibles are the key drivers of competitive advantage in achieving goals, many changes are being witnessed in the delivery of higher education as well as on the demands placed on HEI so that they become storehouses of innovation where wellsprings of talents are nourished and sustained. [21]. In nutshell the roles of knowledge management in higher education institutions are: managing, organizing and increasing student enrollments, and pass percentage, better placement of graduates, cost effective utilization of technology, making created knowledge retrieval easier, efficient knowledge transfer to students from faculty members and from students to industry. (Figure 1 & 2)





5. KMS CONCEPTUAL MODEL IN HEIS

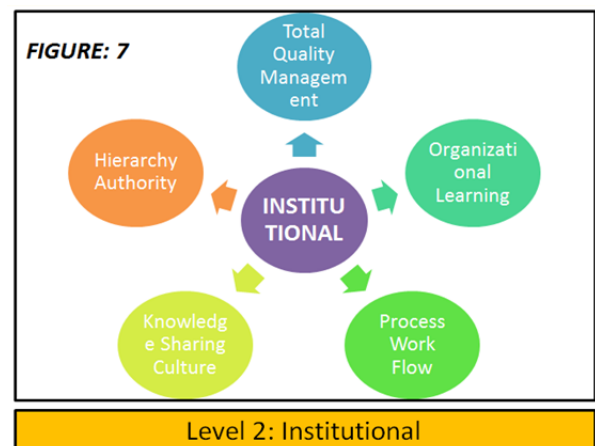
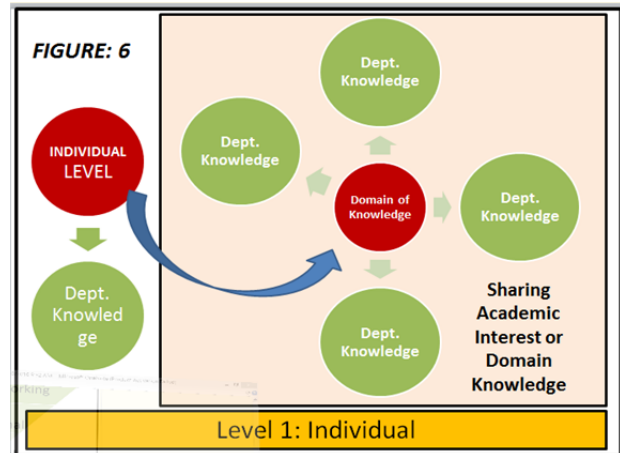
Universities are the main instruments of society for the constant pursuit of knowledge. Knowledge management in educational settings should provide a set of designs for linking people, processes, and technologies and discuss how organizations can promote policies and practices that help people share and manage knowledge [19]. There are two types of knowledge involved in higher education settings: academic knowledge and organizational knowledge. Academic knowledge is the primary purpose of universities and colleges, while Organizational knowledge refers to knowledge of the overall business of an institution: its strength and weaknesses, the markets it serves, and the factors critical to organizational success [4]

This article suggests strategies for the formation of KMS in an academic knowledge framework and organizational knowledge framework. Each dimension is explained further. It is believed that knowledge management can be used to support educational administration, which in turn supports teaching and learning [3]

5.1 Academic Knowledge Framework

The four major processes to form a culture of knowledge sharing and collaboration are: (1) making knowledge visible, (2) increasing knowledge intensity, (3) building knowledge infrastructure, and (4) developing a knowledge culture [7]. This paper explores three strategies to establish knowledge system within the academic framework: individual strategy, institutional strategy and network strategy. These strategies are explained as three levels, it start with level 1 which is individual strategy of faculty followed by the institutional strategy the level 2 and finally level 3 is networking with other institutions etc. this is presented in figure 5.

From an academic knowledge perspective, the learning community should start at the individual level, create departmental knowledge, create domains of knowledge across departments that share academic interests or disciplines, create institutional knowledge networks and networks with other institutions and corporations [6] figure 6, 7 & 8.



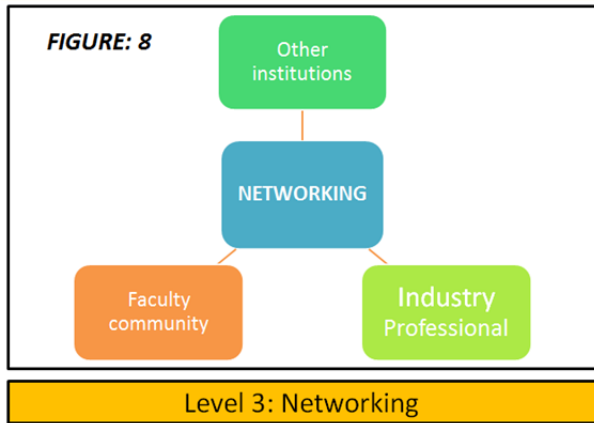


FIGURE 4: Enhanced KM Multi-modeling Procedure

ORGANIZATIONAL KNOWLEDGE	CULTURE 1- Training and development for staff, 2- Environment for practice, 3- Introducing learning organizations	INDIVIDUAL 1- Faculty professional development. 2- Faculty members should enhance their knowledge, skill and ability, 3- Promoting faculty members for research, workshops, conferences, and symposiums	ACADEMICKNOWLEDGE
	TECHNOLOGY 1- Use of intranets, electronic data base, etc. 2- Automated solutions to ease the burden, 3- Application, and dissemination of organizational knowledge.	INSTITUTIONAL 1- Generating organizational learning, 2- Easy excess to valuable knowledge 3- Awareness for Knowledge Management.	
	MEASUREMENT 1- Benchmarking against other Institutions, 2- Allocating resources that measurably increase the knowledge base, 3- Accessing impact of KM to the strategic plan.	NETWORK 1- Creating knowledge databases like alumni, student employers, research work etc. 2- Database for course materials, 3- Online social and professional communities and Student forums etc.	
	LEADERSHIP 1- KM strategic planning in alignment with mission/vision, 2- Recruiting knowledgeable employees, 3- Assessing employees for knowledgeable contribution.		

5.2 Organizational Knowledge Framework

The most generally recognized four organizational knowledge management strategies are culture, leadership, technology, and measurement [6], The examples of culture strategies in universities include staff development and training, communities of practice, and promotion of learning organizations. KM leadership strategies in universities include KM strategic planning in alignment with mission/vision, hiring knowledgeable employees, and evaluating employees for knowledgeable contribution. The university is responsible for providing infrastructure of tools, systems (intranets, web pages, electronic repositories, and data base, etc.), platforms, and automated solutions that centralized the development and distribution of organizational knowledge. Measurement strategies may include benchmarking against other universities, allocating resources toward efforts that measurably increase the knowledge base, and linking and accessing impact of KM to the strategic plan [4]. Many KM application experts recommend the multi-perspective modeling approach [25]. Models have been used previously from business management, such as SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis, balanced scorecards [11] & benchmarking as good sources of techniques. It has been presented in figure 3 [25]. The figure 4 is the comprehensive explanation of the KM conceptual model introduced by [25]

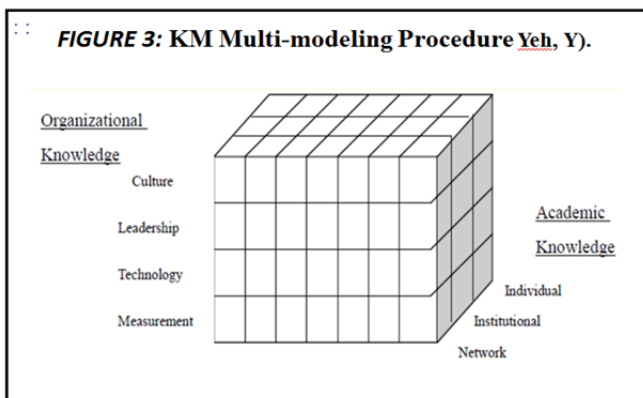
6. SETTING THE STAGE

India is the second most populated country in the world with large number of its white color workers working inside and outside India. Also India is well known for its cheap and quality education worldwide and it is the destination of achieving education for various African & Arab countries. The higher education sector in India is administered by Human Resource Development (HRD) Ministry, University Grant Commission provide grant and norms to Indian Universities. The professional courses like MBA, B.Tech., B.Ed. etc. are accredited by various relevant accrediting bodies like AICTE, NAAC, NTCE etc. these accreditations are mandatory to run HEIs in India.

The Landmark Technical Campus located on NH-24 Delhi-Moradabad highway is 780th approved college of Dr. APJ Abdul Kalam Technical University (APJAKTU) running BBA, Polytechnic, MBA and B.Tech. courses out of which its MBA & B.Tech. courses are accredited by AICTE with 240 seats in MBA and about 460 in B.Tech various branches in 2014-15 session.

Beside other Colleges and 5 private universities in and around Moradabad region along with APJAKTU approved 841 colleges are adding spice to the competition. It's really a stiff competition among the HEIs of Moradabad region.

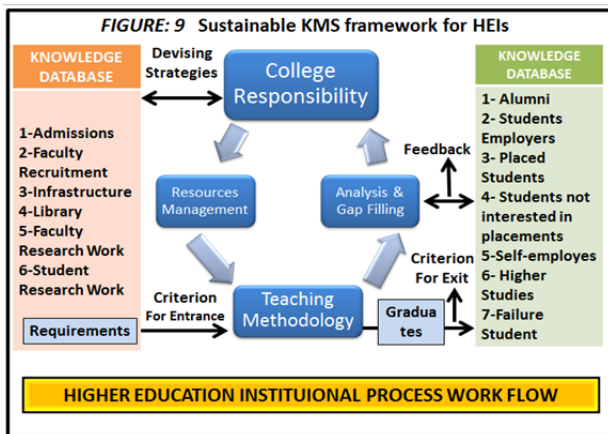
LTC was established in 2010 with a good start but the year 2013-14 saw a deep decline in enrollments and faculty turnover was very high, despite fee reduction, this all happens due to intensified advertisement campaign by the competitors. The LTC administration decided to adopt some new sustainable strategy to combat their competitors and acquire more quality students. This could be possible only by adapting sustainable knowledge management system which can help to efficiently and effectively utilize created knowledge and that too at a faster rate.



7. KMS APPLICATION FRAMEWORK IN LTC

The management of LTC recognized the need for organizational change strategically in the competitive higher education sector and with the support from management and the faculty members; LTC begins the voyage for choosing and application of knowledge management system. At this juncture, knowledge management is a new idea to most members of the college. Knowledge sharing was taboo in the college. Thus, awareness campaign is required to be conducted to change the mindset of the staff members. In order to ensure effective application of KMS, the Dean and Director of the college selects 40 representatives from faculty members of B.Tech. and MBA to attend 10 brainstorming sessions and 11 follow-up meetings. The sustainable Knowledge Management System framework is presented in the figure 9.

The design of an sustainable KMS framework should focus on the user (management, faculty, students, & industry), the proposed knowledge management system can improve routine work flow of HEIs. At the strategic level it is the responsibility of the college to devise strategies to establish knowledge databases pertaining to the student admissions, Faculty Recruitment, Infrastructure, Library, Faculty and student Research work, it also contain repository of norm and basic requirements by accrediting agencies, which will explain the criteria for entrance and exit from the college for students as well as staff. Also knowledge databases on the right side in green color (figure 9) can be developed for Alumni, Students Employers, Placed Students, Students not interested in placements, Self-employed, Higher Studies and Failure Students records. The feedback from them, are very helpful in gap filling and taking corrective action.



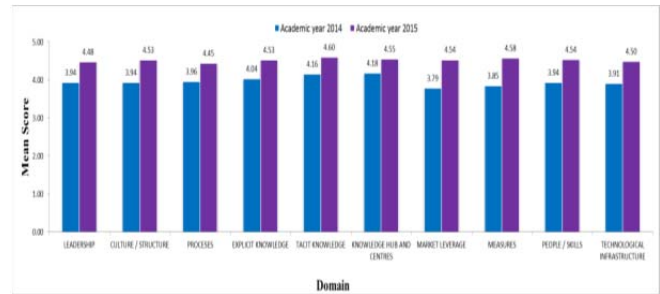
8. OBSERVATIONS AND INFERENCE

Two surveys were conducted one at the end of the 2013-14 session and before implementing KMS framework another was conducted at the end of 2014-15 session after implementation of proposed KMS framework (figure 9).

Questions were asked from 10 domains from 500 faculty members and students. And it had been analyzed and observed

that there is a constant improvement in all the domains after implementation of proposed KMS framework (figure 9). The table 1 explains that each domain response score values expressed by Mean±SD. When compare with mean score of academic year 2014 to 2015 there is significant increase through implementation of proposed KMS framework and also its analyzed by t-test to prove that there are statistical significant (t and p values given in table 1 represents significant<0.05) in each domain respectively .

Figure 10: Graphic presentation of Questionnaire



It is apparent from the above graph that after implementing proposed KMS of figure 9, the performance of Landmark Technical Campus improved in every domain from 15 to 20%.approximaetly and it is considered as remarkable & it will improve in future too

Table 1: Based on Questionnaire

Domain	Acad emic year	Mean±SD	t value	p value
LEADERSHIP	2014	3.938±1.121	-9.596	.000
	2015	4.48±0.58*		
CULTURE / STRUCTURE	2014	3.942±1.09	-10.649	.000
	2015	4.532±0.5*		
PROCESES	2014	3.958±1.09	-8.833	.000
	2015	4.448±0.60*		
EXPLICIT KNOWLEDGE	2014	4.036±1.05	-9.356	.000
	2015	4.528±0.53*		
TACIT KNOWLEDGE	2014	4.16±1.05	-8.421	.000
	2015	4.6±0.51*		
KNOWLEDGE HUB AND CENTRES	2014	4.184±1.05	-6.962	.000
	2015	4.554±0.55*		
MARKET LEVERAGE	2014	3.792±1.22	-12.565	.000
	2015	4.536±0.52*		
MEASURES	2014	3.854±1.18	-12.597	.000
	2015	4.584±0.52*		
PEOPLE / SKILLS	2014	3.938±1.12	-10.786	.000
	2015	4.54±0.54*		
TECHNOLOGICAL INFRASTRUCTURE	2014	3.908±1.11	-10.607	.000
	2015	4.496±0.56*		

*- p<0.05,t-test,represents there is significance difference between academic years

Table 2: DEFINITION

5 = Strongly agree:	The statement is true all, or, almost all of the time, and/or very well done.
4 = Agree:	The statement is true most of the time, and/or fairly well done.
3 = True sometimes:	Something is done about half the time.
2 = Disagree:	Something is done poorly, or usually not done.
1 = Strongly disagree:	Something is done very badly, or never, or very rarely done.

9. SUMMARY

The higher education institutions are facing fierce competition and financial crises many institutions of high repute in their initial stage are now shut down or performing bad. The authors of this paper try to justify a KMS framework through surveys conducted before and after its implementation.

The results of the surveys concluded, that the proposed framework is efficient and effective in improving the performance of the college, in the area of admissions, faculty turnover, and it is also observed that students and faculty members looks more satisfied and cooperative. Job placement was also improved steeply for MBA students.

10. ACKNOWLEDGEMENTS

The authors are grateful to the Chairman, Director, Staff and volunteered students, those took part not only in survey but also helpful in implementing sustainable Knowledge Management System for the college, the authors hope that this model will be remarkable in the field of Knowledge Management for Higher Educational Institutions of India and elsewhere with customization.

REFERENCES

- [1] Abdullah, R., Selamat, M. et al, "A Framework for Knowledge Management Systems Implementation in Collaborative Environment for Higher Learning Institution". *Journal of Knowledge management Practice*; 2005
- [2] Allee, V.. 12 principles of knowledge management. *Training and Development*, 1997; 51, 11-18.
- [3] Becerra-Fernandez, V. & Sabherwal, R. . Organizational Knowledge Management: A Contingency Perspective. *Journal of Management Information Systems*, 2001; 18, 1, 23-56.
- [4] Coukos-Semmel, E.. Knowledge management in research university: The processes and strategies. Paper presented at the American Educational Research Association 2003 Annual Meeting, Chicago, Illinois.
- [5] Drucker, P. F.. *Post-Capitalist Society*. New York: Harper Business. 1993
- [6] Galbreath, J. Knowledge management technology in education: An overview. *Educational Technology*, 2000; pp. 40, 5, 28-33.
- [7] Huang, K. Capitalizing on intellectual assets. *IBM Systems Journal*, 1998, pp. 37, 4, 570-584.
- [8] Hull, R., Coombs, R. & Peltu, M. Knowledge Management Practices for Innovation: An Audit Tool for Improvement. *International Journal of Technology Management*, 2000, pp. 20, 633-656
- [9] Hussein, T. (2014), "Beyond CSR- A Role for Higher Educational Institutions'-Strategy to Leverage CSR for Competitive. 8th International Conference on Corporate Social Responsibility; 17-18 January 2014, Bangaluru, India
- [10] Hussein, T., and Khan, S.H. Data mining & Knowledge Management through Information Technology. *SSPS-IJBMR*, 2014, pp. 142-149. Retrieved from http://www.sspsindia.in/IT-in-KM_5.pdf
- [11] Kaplan, R. S. & Norton, D. P. Using the balanced Scorecard as a strategic management system. *Harvard Business Review*, 1996, pp. 74-1, 75-78.
- [12] Kok, A, "Intellectual Capital Management as Part of Knowledge management Initiatives at Institutions of Higher Learning". *The Electronic Journal of Knowledge Management*, Vol. 5, Issue 2, 2007, pp. 181-192.
- [13] Mellander, K.. Engaging the human spirit: A knowledge evolution demands the right conditions for learning. *Journal of Intellectual Capital*, 2001, 2, 2, pp. 165-171.
- [14] Miller, D., & Shamsie, J., The resource based view of the firm in two environments: the Hollywood Film Studios from 1936 to 1965, *Academy of Management Journal*, 39(3), 519-543, 1996
- [15] Nawaz M., Nishad, Gomes A. Mary; Review of Knowledge Management in Higher Education Institutions; *European Journal of Business and Management* www.iiste.org ISSN 2222-1905 (Paper) ISSN 2222-2839 (Online) Vol.6, No.7, 2014}
- [16] Nonaka, I. & Takeuchi, H.. *The knowledge-Creating company*, Oxford, UK: Oxford University Press, 1995
- [17] Oxbrow, N.. Skills and competencies to succeed in a knowledge economy. *Information Outlook*, 2000, pp. 4, 10, 18-23.
- [18] Petrides, L. A. & Guiney, S. Z.. *Knowledge management in education: Defining the landscape*. California: Institute for the Study of Knowledge Management in Education, 2002.
- [19] Petrides, L. A. & Nodine, T. R.. Knowledge Management for School Leaders: An ecological framework for thinking schools. *Teachers College Record*, 2003, pp. 104, 8, 1702-1717.
- [20] Petrides et . al., {Petrides A. L. & Nodine R.T, "Knowledge Management in Education – Defining the Landscape", Institute of Study of Knowledge Management in Education, A Monograph sponsored by SUN MICROSYSTEMS, March 2003
- [21] Seleim, A., Ashour, A. and Bontis, N., Intellectual capital in Egyptian software firms, *The Learning Organization: An International Journal*, 11(4/5), 332-346, 2004.
- [22] Sveiby, K.. *What is knowledge management?* Retrieved Dec. 23, 2000 from <http://www.sveiby.com.au/knowledgemanagement.html>.
- [23] The American Productivity and Quality Center and Arthur Andersen Consulting, 1997.
- [24] Von Krogh, G., Ichijo, K., & Nonaka, I.. *Enabling Knowledge Creation*. Oxford, UK: Oxford University Press, 2001.
- [25] Yeh, C.M.Y., "The Implementation of Knowledge Management System in Taiwan's Higher Education", *Journal of College Teaching and Learning*, 2005, Vol.2, No.9, pp. 35-41

APPENDIX: 1

QUESTIONNAIRE TO ASSESS PREVALENT LEVEL OF KNOWLEDGE MANAGEMENT IN LTC

This questionnaire is being circulated to gather information regarding the prevalent level of Knowledge Management in your college. The questionnaire focused on understanding the way in which Knowledge Management Practices is affecting your college.

Kindly co-operate and fill the following questionnaire (it would take only 5 minutes) as your survey responses and opinion is very valuable and helps in the research study. Your opinions will be strictly confidential and the data from this research will be reported only in the aggregate. The information will not be used for any other purpose other than for the research study.

Thank you very much for your time and support.

Name	
Designation	Department: MBA B.Tech.

#	Domain	Query	Score
1	LEADERSHIP	Does your organization have a compelling knowledge vision and strategy, actively promoted by your Dean or Director, that clearly articulates how knowledge management contributes to achieving institutional objectives?	
2	CULTURE / STRUCTURE	Is knowledge sharing across departmental boundaries actively encouraged and rewarded? Do workplace settings and format of meetings encourage informal knowledge exchange?	
3	PROCESSES	Does your organization have systematic processes for gathering, organizing, exploiting and protecting key knowledge assets, including those from external sources?	
4	EXPLICIT KNOWLEDGE	Is there a rigorously maintained knowledge catalogue, with a structured knowledge tree or taxonomy, which clearly identifies knowledge owners and is readily accessible across the organization?	
5	TACIT KNOWLEDGE	Do you know who your best experts are for different domains of key knowledge, and do you have in place mechanisms to capture their tacit knowledge into an explicit format?	
6	KNOWLEDGE HUB AND CENTRES	Are there librarians or information management staff that coordinate knowledge repositories and act as focal points for provision of information to support key decision making?	
7	MARKET LEVERAGE	Are your knowledge and knowledge management capabilities packaged into products and services and promoted in your institution's external marketing?	
8	MEASURES	Does your institution measure and manage its intellectual capital (IC) in a systematic manner?	
9	PEOPLE / SKILLS	Have specific knowledge roles been identified and assigned, and are all colleagues and students are trained in basic knowledge management techniques?	
10	TECHNOLOGICAL INFRASTRUCTURE	Can all important information be quickly found by new users on your intranet/ portal (or similar network) within three mouse clicks?	
TOTAL			