



KNOWLEDGE MANAGEMENT IN HIGHER EDUCATION (A Case Study)

Dr. Ram Shukla, Faculty (Operations Area),

Indian Institute of Management – Rohtak (IIM Rohtak), M D University Campus,

Rohtak, Haryana. INDIA.

ABSTRACT

The paper utilizes Knowledge Management (KM) pillars to enterprise learning – leadership, organization, technology and learning - as a lens to investigate and understand Knowledge Management practices and perceptions within Higher Education Institutions (HEI), looking at challenges of implementation within this sector. Higher Education Institutions are very complex institutions, with diverse backgrounds, history, culture, resources and missions. It focuses on two aspects of the case study – the characteristics of universities and academics that hinder or promote the implementation of KM, and the perceptions of Knowledge Management and its challenges for implementation within the HEI sector. The paper highlights the information systems used in the Instruction Division of a top-tier institution. This paper also gives a detailed description of the work done by Instruction Division, how does it manage the work, the information flow within the division and how is it connected to other divisions. Initial findings are presented.

Keywords: knowledge management, knowledge repository, higher education, Organizational Knowledge



1. Introduction

Knowledge Management (KM) has increased in popularity and credibility as a management tool, as well as a research discipline, over the past decade. KM is a term that has not only gained credibility over the years by virtue of the increased research projects on the subject but also through the increased application of it as a management tool within business organisations. This report investigates the perceptions of Knowledge Management within Higher Education as a management tool, and presents the nature of academics and universities, and the related challenges for KM implementation within this context. The research uses a methodological approach combined with a case study of Top-tier Institution, one of the premier engineering and sciences institute in India. The paper begins with a brief introduction to the Indian Higher Education context given in relation to its history and the Knowledge Economy, then presents the research framework and some of the initial findings that emerged from the analysis, finally, the report ends with some concluding remarks.

1.1 Higher Education and the Knowledge Economy

Applying KM in Higher Education Using knowledge management techniques and technologies in higher education is as vital as it is in the corporate sector. If done effectively, it can lead to better decision-making capabilities, reduced “product” development cycle time (for example, curriculum development and research), improved academic and administrative services, and reduced costs.

Relying on the institutional knowledge of unique individuals can hamper the flexibility and responsiveness of any organization. The challenge is to convert the information that currently resides in those individuals and make it widely and easily available to any faculty member, staff person, or other constituent.



An institution wide approach to knowledge management can lead to exponential improvements in sharing knowledge—both explicit and tacit— and the subsequent surge benefits.

If it is easy for goods, capital, labour and ideas to move around, what do HEIs need to do to stay competitive to ensure the quality of their products and to ensure that a good academic experience is achieved by their students? Globalisation and marketisation have therefore forced Higher Education Institutions to think about the way in which they teach, conduct research and manage the institution and its various stakeholders.

2. 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. Nonaka and Takeuchi (1995) first proposed the concept of explicit and tacit knowledge. Explicit knowledge is the knowledge that can be written down, processed by information systems, codified or recorded, and archived and protected by the organization. Tacit knowledge represents knowledge that cannot be written down, exists in people's heads and is extremely difficult to transfer. Both explicit knowledge and tacit knowledge are the intangible assets any organization holds to provide excellent service to their customers. Knowledge has become the driving force in our economy today. It powers the ability of professionals to be their best, and to deliver value service to customers.

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 (Drucker, 1993) and expert labor (Hull, Coombs, &Peltu, 2000) think that knowledge management is important to any entity.

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. (Allee, 1997). Members can effectively accomplish organizational goals through knowledge management processes and procedures (Von Krogh, Ichijo, &Nonaka, 2001). A firm that effectively manages knowledge is likely to be considered a learning organization (Mellander,



2001). Knowledge dissemination and responsiveness to knowledge are cited repeatedly as the most effective way to a competitive advantage (Oxbrow, 2000; McEvily, Das & McCabe, 2000). While the need for effective managing of knowledge is accepted, much of the literature continues to explore measurement and its effect on outcomes. Only Sveiby (2000) and Becerra-Fernandez and Sabherwal (2001) have developed inventories and clear procedures or methods to measure the effectiveness of such activities.

3. Objectives

Following are the objectives of the research

- Reasons to adopt Knowledge Management
- Application and Benefits of Knowledge Management for the Curriculum Development Process
- Knowledge management as a strategy for capacity building
- Knowledge sharing dynamics in higher education
- Ethical issues that arise in managing knowledge at institutions of higher learning
- Implementing knowledge management in higher education: key processes and strategies
- Measurement of impact of knowledge management programmes
- Study the awareness of KM in institutions of higher learning.

4. Methodology

The interviews were conducted in a semi-structured way. A select number of participants requested to be part of a two-person interview rather than being interviewed one-on-one. Although the researchers found the one-on-one interviews to be more constructive as it allowed individuals to provide their own perspectives without having a colleague influence it, the one-to-two interviews provided very valuable perspectives as well which were used in the case study.

Having scanned the literature for KM models, perspectives and frameworks, the researchers came across two sets of models and perspectives on KM which provided the lens through which to investigate KM at HEIs in the UK; 1) Stankovsky's (2005) model on Enterprise learning depicted in Fig.1, was used to frame the interview questions to better understand perceptions



and practices within the four pillars in HEIs i.e. Technology, Learning, the Organisation, and Leadership. 2) Davenport and Prusak (2000) have a very pragmatic approach to Knowledge Management and hence their perspective on what KM is was used.

As KM has such a diverse range of definitions, and can be very differently understood depending on the discipline it is being viewed from, it was necessary to have a frame to structure the interview in some way so as to optimise its value. This approach is consistent with researchers who have studied and used Grounded Approach Theory and have found that entering the research field without any preconceived ideas or frameworks or an understanding of the area is very difficult to do and there is debate about the aimlessness that could happen if there is no idea of the theory of the field of research.

5. Analysis and discussions

5.1 KMS Conceptual model in Higher Education

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 (Petrides&Nodine, 2003). 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. 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 (Coukos-Semmel, 2003).

5.1.1 Academic Knowledge Framework

Huang (1998) suggested four major processes to form a culture of knowledge sharing and collaboration. They are: (1) making knowledge visible, (2) increasing knowledge intensity, (3) building knowledge infrastructure, and (4) developing a knowledge culture. 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 (Galbreath, 2000, p. 28). This paper presents three strategies to establish knowledge ecologies within the academic framework: individual strategy, institutional strategy and network strategy.

The capitalization of collective knowledge begins with sharing in knowledge communities: from individual, through teams and groups, to organizations. Individual strategy mainly deals with the teacher's individual professional growth. KM helps teachers develop their teaching ability, skill and experience through e-learning, teaching portfolio, and action research. Once individual knowledge is captured, institutions and processes must be established to compel its dissemination throughout the organization. Knowledge management is then escalated to the organizational level. Institutional strategy emphasizes knowledge sharing through school-based teacher education, organizational learning, sharing culture, and teacher community. Knowledge sharing is not limited to the organization. Network strategy calls for establishment of knowledge map for teaching, knowledge database and instructional resource center.

5.1.2 Organizational Knowledge Framework

The most generally recognized four organizational knowledge management strategies are culture, leadership, technology, and measurement (The American Productivity and Quality Center and Arthur Andersen Consulting, 1997). As suggested by Coukos-Semmel (2003), 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, application, 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.

Many KM application experts recommend the multi-perspective modeling approach. Models have been used previously from business management, such as SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis, balanced scorecards (Kaplan & Norton, 1996), and benchmarking as good sources of techniques.



5.2 Reasons for adopting Knowledge Management

A number of claims exist as to the motivations leading universities to undertake a KM effort. Typical considerations driving a KM effort include:

- Making available increased knowledge content in the development and provision of products and services
- Achieving shorter new product development cycles
- Facilitating and managing innovation and organizational learning
- Leveraging the expertise of people across the organization
- Increasing network connectivity between internal and external individuals
- Managing business environments and allowing employees to obtain relevant insights and ideas appropriate to their work
- Managing intellectual capital and intellectual assets in the workforce (such as the expertise and know-how possessed by key individuals)

5.3 Guidelines for Knowledge Management

As institutions launch knowledge management initiatives, they can learn lessons from their counterparts in the corporate sector. Some key points to remember are:

- i. *Start with strategy.* Before doing anything else, determine what you want to accomplish with knowledge management.
- ii. Organizational infrastructure—human resources, financial measurements of success, and information technology— should support knowledge management.
- iii. *Think of technology as an enabler, and measure the impact of KM* in financial terms, such as cost reductions, customer satisfaction, and speed to market.
- iv. *Seek a high-level champion for the initiative*— someone who believes in its benefits and who can advocate as needed.



- v. *Select a pilot project for knowledge management*— ideally one with high impact on the organization but of low risk to build credibility for knowledge management. If possible, make the pilot one that participants will enjoy and find rewarding.
- vi. *Develop a detailed action plan for the pilot* that defines the process, the IT infrastructure, and the roles and incentives of the pilot project team.
- vii. *After the pilot, assess the results and refine the action plan.*

5.4 Case Background

5.4.1 Top-tier Institution Overview

The institution under study is an all-India top-tier Institute for higher education. The primary motive of this institution is to "train young men and women able and eager to create and put into action such ideas, methods, techniques and information".

Over the years, this institution has provided the highest quality technical education to students from all over India admitted on the basis of merit. Its graduates may be found throughout the world in all areas of engineering, science and commerce. This institution symbolizes the maturing of Indian technical ability and "can-do" entrepreneurial spirit, especially as derived from the private sector.

5.5 KM Application Framework in Top-tier Institution

Leaders of this TOP-TIER INSTITUTION recognized the need for organizational change to reposition strategically in the competitive higher education industry. With the support from high-level management and the board of directors, TOP-TIER INSTITUTION began its journey for implementation. At this point of time, knowledge management is a new idea to most members of the college. Knowledge is a valuable resource and it is natural for members to hoard knowledge from others. Sharing is not a common phenomenon on campus.

Organization culture can inhibit or enhance organizational change efforts in knowledge management initiatives. Proper procedures are taken to ensure the concept of KM is correctly understood and thus creates a culture of sharing using organization-wide vocabulary.



KM implementation model in Top-tier Institution:

Leadership Management Support → Define KM Strategies → Define KM Road Maps → KM process & Implementation → Knowledge Base & Transfer → KM Infrastructure & Maintenance → Measurement & Evaluation

Instruction Division is one of the most important administrative blocks for this institution. They keep track of each course, each teacher and look to improve the whole academic environment of this institution. The various activities done by the Instruction Division are as follows:

a. Course Offerings.

The cycle of Division activities starts naturally with the list of courses to be offered during the semester; a task that begins with a lead time of three to four months. The task is greatly facilitated by the Bulletin of the Institute. In the initial phase, after the formation of Divisions, it was the Instruction Division which compiled all programmes, courses and their descriptions into a well documented Bulletin, while a separate Bulletin was used for admission purposes.

During the recent years several emerging area courses (EA) and project – type courses have been

developed at THIS INSTITUTION. These help the students channelize their creativity thinking and to work under expert guidance. With the inception of the nonformal system of education as Distance Learning Programme a new dimension has been added to the task of course offering.

Information Flow steps.

- a.** The Instruction Division contacts the Group Leaders for the various courses to be offered in the next semester.
- b.** After this information is received, Instruction Division contacts the Academic Registration and Counseling Division (ARCD) for information on whether the course is a compulsory course for the students or electives. If they are electives, the division checks the records for how many students have been opting for the course in the past, the variety of the course or if the courses are required to be provided to the students. This information is then processed and sent to the Time table department in the Instruction Division.



- c. After this process, it checks out the institute bulleting and its past records for the information on that course. On collecting this information, they sort it according to the disciplines. These course descriptions are then sent to the Group Leaders, to ask about further modifications.
- d. On obtaining this information, they sent it to the printing department for printing in the course description and record keeping. From the previous records they assign the course numbers for each course and send it to the time-table.
- e. They also collect information from the Group Leaders regarding any new courses to be introduced. The Group Leaders also provide information on re-starting of previously un-offered courses.

This information flow is in a very systematic way and helps the course offering occur in a smooth and efficient way. The information is processed properly and the correct information reaches the correct information. This makes it easier for the people to understand the process and be highly useful in the Course offering process.

a. Teaching Load Allocation

The task of deciding the courses to be offered as outlined above, and of allocating the courses to the INSTRUCTOR is centralized in the hands of Instruction Division to achieve a coordinated, smooth and optimal operation. For the purpose of allocation, the Instruction Division utilizes as well as updates the computerized staff data which, apart from the routine particulars of various faculty, lists the various courses they have taught in the past and their additional capabilities. Simultaneously, the Practice School Division is also consulted to accommodate any rotation of faculty within campus and off-campus operations and also if additional faculty has to be separated for newly starting activities in Practice School Division and / or Distance Learning Unit.

Particular care is taken in formation of teams to teach interdisciplinary courses where teams of faculty from various disciplines are drawn.

With the finalization of the course offering and teaching load allocation the stage is reached for completing the semester time – table. A letter is sent to every faculty almost six weeks ahead of the start of the course so that the faculty can make preparations in this direction and also fulfill the additional requirements of the Instruction Division to be described later.



Information flow steps.

1. All the courses are identified by the Teaching Load Allocation (TLA) department team of Instruction Division. They gather this information from the Course offerings activity.
2. This information is then passed on to the group leaders and all the faculty members. They ask the teachers to provide the Instruction Division, with names of courses they would like to take in an order of preference (min 3).
3. Course-wise distribution of courses is done and the output is sent to the Group Leaders.
4. Once this information reaches the GL, the faculty members under the discipline sit and decide on the courses to be taken by the people to avoid clashes.
5. The GL then fills out the changes, or accepts the form forwarded as it is.
6. This information is then passed on to the Time Table making activity, where all this information is required.

b. Time Table making

The task of framing a time – table at this institution is complex, for the educational programme allows several flexibilities to the students and teachers. The magnitude of this task could be comprehended by listing some of the flexibilities of our educational structure. They are:

- Course wise passing (with some courses linked through prerequisites).
- The student can accelerate and decelerate his programme according to his own objectives and capabilities.
- Wide choice of electives which cuts across year, level and disciplines.
- Admission in both semesters.
- Admission with advanced standing and admission with marginal deficiency.
- Dual degree with almost any combination from amongst the degrees offered by the Institute



Information flow steps.

1. All the courses are identified by the Teaching Load Allocation (TLA) department team of Instruction Division. They gather this information from the Course offerings activity.
2. This information is then passed on to the group leaders and all the faculty members. They ask the teachers to provide the Instruction Division, with names of courses they would like to take in an order of preference (min 3).
3. Course-wise distribution of courses is done and the output is sent to the Group Leaders.
4. Once this information reaches the GL, the faculty members under the discipline sit and decide on the courses to be taken by the people to avoid clashes.
5. The GL then fills out the changes, or accepts the form forwarded as it is.
6. This information is then passed on to the Time Table making activity, where all this information is required.

c. Test Scheduling

Information Flow steps:

1. All the courses are identified by the Time table making department team of Instruction Division. They gather this information from the Course offerings activity.
2. This information is then passed on to the CAHU, where the information is directly entered into a software. This software, automatically checks for courses, their common hours if any, and according to set norms decides test dates.
3. The Instructor in-charge also puts in their preferences regarding probable dates required. Accordingly, the input is given to the software and it generates the required test schedule.
4. It then checks for any clashes, between 2 courses
5. It then checks if any test has been scheduled during the first 3 weeks of the course commencement, or a fortnight before the comprehensive examination.
6. It also checks for holidays, and any tests scheduled on holidays are automatically re-scheduled.



7. The final output is sent back from the CAHU, to the Instruction division, which forwards this to the printing department and the room allotment and invigilator allotment team.

Instruction Division is very important for the administration of this institution. Without the instruction Division, the management of teaching staff and resources for the students would not be possible. It shows how knowledge can be utilized to improve the functionalities.

The Instruction fulfills its main responsibility of the Instruction Division is to ensure that teaching across the Institute is carried out in an efficient and effective manner. One can get a fair picture of how effectively the Instruction Division coordinates with various Divisions.

All the activities performed by the Instruction Division are very well planned and managed. There are steps being taken in order to increase automation and reduce man-power usage in all small steps involved in the functioning of the Instruction Division.

5.6 KM Application and its Benefits

The research and interviews led us to derive the KM application and benefits for various administrative units in an institute. Initial findings are presented here:

KM Application in Strategic Planning

1. Office of Knowledge Management emerging from the previous office of Institutional Research.
2. Portal for internal information that catalogues the strategic plans, reports developed for external audiences, clear data definitions, presentations by executives and so forth.
3. Portal for external information, including benchmark studies, environmental scans, competitor data, link to research group, higher education research groups and so forth
4. Monthly "market watch" developed in tandem with Admissions, Continuing Education, Alumni and Development and others that document trends

Benefits

1. Improved ability to support the trend toward decentralized strategic planning and decision making (for example, block budgeting, responsibility centre management). Better information leads to better decisions!
2. Improved sharing of internal and external information to minimize redundant efforts and lessen the reporting burden plaguing many institutions today.
3. Enhanced ability to develop up-to-



- and potential implications
5. Repository of data related to accountability and outcomes tracking by monitoring assessments, performance indicators, benchmarking and so forth.
 4. Shared knowledge from a variety of constituents to begin to create a “learning organization” which is responsive to market trends.

KM Application in Curriculum Development Process

1. Repository of curriculum revision efforts that includes research conducted, effectiveness measures, best practices, lessons learned and so forth.
2. Repository of content modularized and arranged to facilitate interdisciplinary curriculum design and development.
3. Portal of information related to teaching and learning with technology, including faculty development opportunities, outcomes tracking, lessons learned, best practices, technology overviews, and so forth.
4. “Hubs” of information in each disciplinary area, including updated materials, recent publications, applicable research, and so forth.
5. Repository of pedagogy and assessment techniques, including best practices, outcomes tracking, faculty development opportunities, and research.
6. Repository of analyzed student evaluations updated each semester for lessons learned and best practices for all faculty.
7. Portal for new faculty with guides for developing curriculum, working with senior faculty, establishing effective teaching styles, advising do’s and don’ts, supervising PhD students, and so forth.
8. Repository of corporate relationships to identify curriculum design advisory task forces, guest

Benefits

1. Enhanced quality of curriculum and programs by identifying and leveraging best practices and monitoring outcomes.
2. Improved speed of curriculum revision and updating.
3. Enhanced faculty development efforts, especially for new faculty.
4. Improved administrative services related to teaching and learning with technology.
5. Improved responsiveness by monitoring and incorporating lessons learned from the experiences of colleagues, student evaluations, and corporate or other constituent input.
6. Interdisciplinary curriculum design and development facilitated by navigating across departmental boundaries.



speakers, adjuncts, case study sites, and so forth.

KM Application in Student and Alumni Services

1. Portal for student services for both students and for faculty and staff at the institution so that they are well informed to advise students. Information could include policies and procedures related to admissions, financial aid, registration, degree audit, billing, payment process, advising and tutoring, housing, dining, and other services. This portal could be personalized for individual schools or student groups to customize service offerings.
2. Portal for career placement services (potentially part of a large portal for all corporate connections) to provide a one-stop service center for students, but also for faculty and staff to ensure they are informed.
3. Repository of student affairs services for faculty and staff to ensure all constituents understand existing services and can provide proper advising.
4. Portal for alumni and development services to minimize redundant efforts; capture contact reports; and link to research, curriculum, and career development efforts.
5. Portal for information on outreach constituents to integrate efforts and minimize redundant efforts.

Benefits

1. Improved services for students.
2. Improved service capability of faculty and staff.
3. Improved services for Alumni and other external constituents.
4. Improved effectiveness and efficiency of advising efforts (to integrate fragmented efforts currently undertaken by faculty, academic support staff, student services staff, and student affairs staff.

KM Application in Research Process

A repository of:

- Research interests within an institution or at affiliated institutions (potential subcontractors).
- Research results (where possible) and funding organizations (federal agencies, foundations and corporations) with easy search capabilities to facilitate interdisciplinary opportunities.

Benefits

1. Increased competitiveness and responsiveness for research grants, contracts, and commercial opportunities.
2. Reduced turnaround time for research.



- Commercial opportunities for research results.

A portal for research administration procedures and best practices related to:

- Funding opportunities.
- Pre-populated proposals, budgets, and protocols.
- Proposal-routing policies and procedures.
- Award notification, account setup, and negotiation policies and procedures.
- Contract and grant management policies and procedures.
- Technical and financial report templates and policies and procedures.
- Overview of internal services, resources, and staff.

3. Minimized devotion of research resources to administrative tasks.

4. Facilitation of interdisciplinary research.

5. Leveraging of previous research and proposal efforts.

6. Improved internal and external services and effectiveness.

7. Reduced administrative costs.

KM Application in Administrative Services

1. Portal for financial services (that is, budgeting and accounting) that includes FAQs, best practices, procedures, templates, and communities of interest to share information and serve as impetus for improvement efforts.
2. Portal for procurement (that is, purchasing, accounts payable, receiving, warehousing) that includes FAQs, best practices, procedures, templates, and communities of interest (for example, by commodity, purchasing vehicle, vendor, and so forth) to share information and serve as impetus for improvement efforts (for example, leverage lessons learned from others in the institution, design on-line vendor sites such as Web-based catalogs).
3. Portal for human resources (that is, vacancy-to-hire, payroll, affirmative action, and so forth) that includes FAQs, best practices, procedures, templates, and

Benefit

1. Improved effectiveness and efficiency of administrative services.
2. Enhanced ability to identify improvement efforts.
3. Improved ability to support the trend toward decentralization (for example, local business centres) by providing guidelines for consistency.
4. Improved compliance with administrative policies such as procurement, preferred vendors, procurement card policies,



communities of interest to share information and serve as impetus for improvement efforts.

budgeting procedures, affirmative action guidelines, and so forth.

5. Improved responsiveness and communication capabilities.

6.0 Summary

Higher education institutions have come to face pressures similar to the private sector. Private colleges are experiencing huge challenges due to the structural change in the higher education industry in Taiwan. In order to deal with the cutting edge competition, management has to adopt new models in search for excellence. It seems reasonable to propose management techniques such as KM and related strategies to enhance quality and performance. Knowledge Management (KM) helps an entity making the collective information and experience available to individual workers.

REFERENCES

1. Allee, V. (1997). 12 principles of knowledge management. *Training and Development*, 51, 11-18.
2. Becerra-Fernandez, V. & Sabherwal, R. (2001). Organizational Knowledge Management: A Contingency Perspective. *Journal of Management Information Systems*, 18, 1, 23-56.
3. Drucker, P. F. (1993). *Post-Capitalist Society*. New York: Harper Business.
4. Galbreath, J. (2000). Knowledge management technology in education: An overview. *Educational Technology*, 40, 5, 28-33.
5. Kaplan, R. S. & Norton, D. P. (1996). Using the balanced Scorecard as a strategic management system. *Harvard Business Review*, 74-1, 75-78.



6. Huang, K. (1998). Capitalizing on intellectual assets. *IBM Systems Journal*, 37, 4, 570-584.
7. Macintosh, A., Filby, I., Kingston, J., & Tate, A., (1998). Knowledge asset road maps. Proceedings of the Second International Conference on Practical Aspects of Knowledge Management (PAKM98), Basel, Switzerland.
8. McEvily, S. K., Das, S., & McCabe, K. (2000). Avoiding competence substitute through knowledge sharing. *Academy of Management Review*, 25, 294-311.
9. Nonaka, I. & Takeuchi, H. (1995). *The knowledge-Creating company*, Oxford, UK: Oxford University Press.
10. Stankosky, M. (2005) Advances in Knowledge Management: University Research Toward an Academic discipline, in Stankosky, M. (Ed.) *Creating the Discipline of Knowledge Management*. Washington, Elsevier Butterworth-Heinemann.