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Knowledge management applications and status in Indian education system: a survey

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ABSTRACT
Knowledge Management is now becoming popular in Education field due to need to disclose the intellectual power available in institution for sharing experiences. It has great potential and should have equal and even greater significance for education sector. Knowledge builds on knowledge and past events helps in generating new knowledge. The main source of generation of knowledge is human efforts which are developed through conducting good educational activities, research activities and generating innovative concepts in the area of interest. All knowledge generating organizations like industries, R and D centers, and higher education academics from colleges to universities are in search of new concepts in their subject of interest and also contribute to knowledge through various means. They are considered as "Knowledge Houses" where knowledge flows from teachers to students and new knowledge is created. Though developed countries has already started knowledge management practices in educational and research institutes still many developing countries yet to start practicing this. In this paper the author discussed the present status of knowledge management in education sector in India, Initiatives taken by various government bodies, importance of knowledge management in education sector especially traditional colleges and universities, strategies used to capture students, teachers and processes knowledge and suggested knowledge management process for higher educational institute in India.

Introduction

Academic Institutes are considered as "Knowledge Houses" where knowledge flows from teachers to students and new knowledge is created. The information generated is covered in different forms and sources like books, journal articles, thesis or dissertations, technical reports, fact finding reports, case studies, patents, development of test methods and standards, different scholarly communications etc. Every academic institution contributes to knowledge. The generated information and knowledge is to be compiled at central place and disseminated among the society for further growth. It is observed that the generated knowledge in the academic institute is not stored or captured properly It is also observed that many a times generated information or knowledge in the academic institute is not known to any one and remains as grey literature, which might be useful if proper recoding is maintained in the organization. In fact academic environment is treasure of knowledge but it is not organized properly and hence utility is also lacking and cause for the repetitions of the activity.

Knowledge Management (KM) in educational institution makes good sense and a good combination of intellectual output of the academic organization if preserved well using technology. In distance or online education system knowledge building is having lots of important. Without that the teaching learning process is not possible. They need to build knowledge repository including classroom teaching videos, online interactions, and many other databases. In traditional education too now universities are making available classroom teaching online in the form of videos so knowledge capturing techniques are taking new place in education system

This research is undertaken for creating an effective model for managing the available and past as well as knowledge within minds of people of an institute in various forms. Also study on data capture, data analysis, data categorization, data mining, data mapping, knowledge mapping, concept mapping, indexing, linking and repackaging of knowledge, tools, techniques, strategies and copyright issues in sharing this knowledge through knowledge base.

Research Objectives:

The main objectives of this research are

- To create knowledge base of captured tacit and explicit knowledge of staff and students/ Institute
- To study the application of ICT and web technology for creating knowledge base
- To study the initiatives taken by the Government
- To study the current situation and/or problems of knowledge management practices and strategies used in the selected NAAC "A" Grade academic institutes in Pune.
- To identify and analyze the development of knowledge management processes, strategies used including critical success factors of knowledge management.
- To find out biggest hurdles in implementing KM in educational institutes.

Review of Research and Development in this area:

What is Knowledge?

Knowledge is an important source for value creation in an organization and needs to be managed carefully-Massa and Testa (2009). It is a vibrant force in the rapidly changing global economy and society. Knowledge includes insight and wisdom of employee and could be used for decision making. It is also

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embedded in work processes, teams and exists in all core functions of an organization as well as its systems and infrastructure. For the Japanese, Knowledge means wisdom acquired from the perspective of the entire personality.

With reference to the educational institute, input by teacher is the data for the student, when he understands the things given by data that is information for the student when he analyses the information it becomes knowledge aspired by him and when he applies in the field it becomes his wisdom.

Types of Knowledge:

There are two types of knowledge viz. explicit knowledge and Tacit Knowledge

Explicit Knowledge: is recorded and well documented information that helps in taking action and also expressed in formal language. It is published and made available for use like primary, secondary information sources and also covers packaged, communicable, transferable, and also easily available. It can be articulated, captured, presented and codified in various forms like words, numbers, specifications, facts, rules, reports, blog post, email or other sort of printed (books and journals) and digital asset, policies and shared without need for discussion.

Tacit knowledge: is knowledge people carry around in their head. It is embedded within the head/minds of researchers of the institution or organization or research unit etc. It covers insights, perceptions, expertise views, techniques and skills, which is unique to the person. Tacit knowledge is not communicated in written form as it is purely personal, specific to any field, and even very difficult to capture, share verbally and transfer in the society.

Author mainly focuses on the tacit knowledge that employee, teachers, students, processes, systems of academic institutes have but they have difficulty in expressing or articulating it. There are two types of tacit knowledge one is knowledge of researchers which could be shared by both individual and groups. Another is tacit knowledge which can convert to explicit so that can be shared among the institute.

What is knowledge Management (KM)?

KM is a process of transforming information and intellectual assets in to value. Knowledge is made available to take action when user needs it. Knowledge is considered as key to generate breakthrough ideas. The real focus of knowledge management is on "doing the right thing" instead of "doing things right". It provides a framework within which the organization views, processes as knowledge processes and all business processes, which involves creation, dissemination and application of knowledge towards organizational sustenance and survival.

Ramanujan and Kesh (2004) described KM as "an organization's ability to gather, organize, share and analyze the knowledge of individuals and groups across the institution in ways that directly impact performance". It is a process through which organizations generate value based on their intellectual capital. The prime motto of KM in Higher education is to unlock the hidden value of information.

Importance of KM in Educational Institutions:

KM helps educational institutes to improve their capacity of gathering and sharing information and knowledge and apply these to problem solving and support the research and continual improvement of their work. KM of the educational system must reflect and comprise information at all levels starting from management level to student level in order to improve professional knowledge of employees, to achieve quality of lecturers and students. In all countries the government releases many funds for such activities.

Education systems are becoming market oriented from its basic democratic and decentralize system. Universities and academic institutes are considered to be responsible for students' achievements in a democratic, contemporary and flexible educational system. In return they get certain compensation for their effort and responsibility. So student's knowledge, skills, talents should be preserved in the knowledge base. It helps them to create new knowledge and gives platform to newly enrolled students.

In educational institute's researchers, faculty experts, students contribute regularly to knowledge base by generating new concepts. Internationalization of higher education needs to share the organizational contribution/knowledge. Therefore Knowledge management provides techniques for capturing tacit knowledge hidden in experts/individual mind and practices and records it for future use. At the time of gradation of the institution's educational performance all tacit and explicit knowledge of past years can make available at one place with searching facility. KM can transform organizational new levels of effectiveness, efficiency, and scope of operation, using advanced technology, data and information made available to users for effective productivity. KM is continually discovering organizational tacit knowledge. It is also useful for building knowledge, for problem solving and decision making purpose. Quality and Service improvement is also achieved.

KM Process:

David Skyrme mentioned that KM process comprises processes of creating, discovering knowledge, knowledge sharing and learning, and knowledge organization. Creation and discovery of knowledge is characterized by data or text mining, content analysis, processes simulation, communities of practice, review, knowledge sharing, mapping of knowledge.

Following diagram shows how KM process generally works as per below diagram.

Figure 1: ***Knowledge culture in Educational Institutes***

As per Author's suggestion KM process for higher education system involves knowledge acquisition in which students and teachers acquires knowledge from Library resources like books, journals, reports, projects, theses and dissertations or we can say from Primary, secondary and tertiary resource and all online resources accessed from Internet. Students and teacher can create knowledge via classroom teaching or interaction. Various kind of activities are conducted in educational institute to capture, create new knowledge and motive students to contribute to new knowledge area by

conducting various activities like classroom teaching, brainstorming sessions, various competitions, projects, assignments, etc. All newly created knowledge should be stored in explicit form like digital form. This knowledge needs to map, analyze, classify, catalogue and at last this knowledge gets ready to share and apply. Different policies needs to be design and get sanction by the management of the college related to what kind of knowledge should be capture and preserved, how long it should be preserved, how to process it, etc.

Challenges in developing KM:

Though the KM practice is beneficial to all institutes including academic still awareness of its development is not yet practiced by college authorities. There is need to create knowledge sharing culture amongst the staff and students as they afraid to share and exchange their own knowledge. Use of ICT and development of advanced skills in teaching professionals for contributing, communicating, capturing, recording and sharing knowledge is lacking. A suitable policy need to be designed regarding the information and knowledge capturing and sharing among the academic professionals within organization using intranet or extranet for group of branches situated at different places under the same management. Infrastructure and technical help from ICT managers, network managers is necessity to all academics.

Moreover, the educational system is now a day's becoming market oriented. They are responsible for student's and staff's achievements. They are answerable to higher governing body. So there should be motivating environment among educational institutes. Faculties are challenged today with different pressures of globalization, extracurricular activities, research, interdisciplinary subjects and complexity of global education market. Educational institutes are now becoming entrepreneurs. Gibb, A A stated in 2005 that global competition pressures are spread in three categories Individual response, Organizational response and Social response.

New demands from educational institutes are preparing students for lifelong learning, distance learning and short educational as well as professional courses and training, global mobility, adaptation of different cultures, part-time job, work in different organizations , increasing employability of graduates so that they will able to take family as well as social responsibilities, giving them value education.

Professional knowledge, capabilities of educational institutes and research created or output has become key factor to the success of an educational institutes. Therefore fundamental need for managing knowledge and make available and accessible necessary knowledge and make use of that knowledge for problem solving or creating new knowledge. Gibb, A rightly said in 2005 that in 21st century the power of successful educational institute depends on its ability to create, manage and use knowledge in the most effective way.

To share knowledge means to learn, understand, extend and repeat the information, the ideas, the views and the resources with each other, connected with, on a specific ground. Globalization demands that our society needs to move faster, work smarter and take more risks than at any time in our history. Earlier due to communication gap in research area duplication of research occurred. But now with open access moment everyone is sharing his knowledge with others through internet media and so it is obviously good for research development. Universities, publishers, libraries and individual researchers started sharing knowledge in the form for consortia, associations, groups with all. The changing research culture playing important role in knowledge sharing as day by day knowledge is adding new dimensions from the corners of the world in every field.

Collaboration between Universities, Industrial organizations and Government can play an important role in the field of knowledge sharing. Knowledge becomes meaningful when it is utilized on practical ground. The researchers invent it and the industrial firms' puts it in practice. Concept of collaboration for research work is not new. The relationship between Industries and Universities seems to be blossoming in many forms all over the world. Many countries like U.K., Germany, US, France, Japan, Canada, Brazil, South Africa are involved in this kind of collaboration on International level too. In India, attempts are made and efforts are increasing in this direction.

According to Parekh (2009) collaboration helps in Sharing valuable knowledge, avoiding re-inventing the wheel, reducing redundant work and cost for invention, Creating knowledge with the help of experts and experienced persons, giving a right direction to the enthusiastic intelligent students, making them experts of future, solving problems aroused at primary level which will save time, money and man power. By collaborations, the firms will inform university and university will frame the research work as per the needs to fulfill the aim.

Colleges are abiding to send all information about research and other activities to the University. University conducts many activities to make staff and students participate in various activities to create new knowledge. It is necessary to maintain separate databases of tacit and explicit knowledge of students and staff year wise to colleges to report to University or any funding agency.

Efforts made by National Knowledge Commission, Government of India, UGC and RUSA in developing KM

In relation to knowledge management and resource sharing Government of India has taken initiative in all departments. All Government organizations, ministries are providing maximum information on their website. That is beneficial to all citizens. Government is promoting use of technology in terms of funds and trainings too. Now affordable tablet PCs are boon to all school going children in India. At International level India has started collaborative efforts in education like exchange (staff, students) programs, fellowships, scholarships, etc with major countries like USA, UK, and other exchange programs. UGC is calling research projects from the researchers to motivate them and making them available on their website too. Provides funding for conferences, seminars, etc which is for nothing but knowledge management and sharing activity. UGC CEC has a vast repository of 17000 educational video programs and nearly 1000 such programs are being added to this collection every year. Programs are telecasted through Vyas Higher Education Channel.

In the first phase of XIth plan UGC proposed to cover 200 Universities and 5000 colleges across the country for achieving the desired objectives by using Broadband, Wireless, DSL, Leased line/TDM/FTDMA VSAT/SCPC/DAMA/Radio Frequency link for establishing connectivity depending upon the geographical location for accessing global resources including multimedia based educational content though networking of colleges and universities and for providing platform for collaboration among teachers and students using communication networks and better access to e-contents, digitization of Indian Intellectual content (thesis/dissertations), union catalogues of books, serials, secondary serial, current holdings etc and other non-book materials for universities and colleges, providing audio/video conferencing systems at universities.

Through eprashala of inflibnet project http://epgp.inflibnet.ac.in/about.php MHRD, under its National Mission on Education through ICT (NME-ICT) has assigned work to the UGC for development of e-content in 77 subjects at postgraduate level. UGC gives funds about 7lakh per subject to the project investigator to create the content and its quality is the key component of education system. High quality, curriculum-based, interactive content in different subjects across all disciplines of social sciences, arts, fine arts & humanities, natural & mathematical sciences, linguistics and languages is being developed under this initiative named **e-PG Pathshala**. This is very good initiative undertaken by the MHRD and UGC to capture tacit knowledge of teachers in their subject and convert it in digital form (explicit) and made available to all students in India.

In 12th comprehensive plan of Rashtriya Uchchatar Abhiyan for the development of state higher education system for ensuring access, equity and quality. Among the many objectives of RUSA following are very much related to knowledge management and sharing.

- Ensure governance, academic and examination (and evaluation) reforms and establish backward and forward linkages between school education, higher education and the job market.
- Expand the institutional base by creating additional capacity in existing institutions and establishing new institutions in un-served and underserved areas by way of up gradation and consolidation.
- Ensure adequate availability of quality faculty in all higher educational institutions and ensure capacity building at all levels.
- Create an enabling atmosphere in institutions to facilitate research and innovation.
- Integrate the skill development efforts of the government through optimum interventions.
- Promote healthy competition amongst states and institutions to address various concerns regarding quality, research and innovation.

The criteria for sanctioning the various grants they asked to share the information of their institutes related to students and teachers, their research work, collaborative work, etc. Component 11 of RUSA is faculty improvement. States will be given funds to develop faculty, improve academic and pedagogical skills of teachers, and develop innovative strategies to enhance quality of teaching, research and innovation by teachers. States may select any of the existing training institution or even a university or Academic Staff College for this purpose

Under Component 16 Funds will be provided to create and maintain strong data systems at the State level for surveys and analysis that could provide information to the national MIS. The RUSA MIS and All India Survey on Higher Education (AISHE) will be integrated. Hence all the participating institutions/states will be mandated to participate in the AISHE and provide detailed information so that the data on State Universities and Colleges can be consolidated. Under this scheme upto 2crore Rupees sanctioned for each state to centrally designed information system to cover all participating bodies and institutions. To provide a common tool to generate standardized information that would help in monitoring progress of reforms, utilization of resources etc.

The former Prime Minister of India, Dr. Manmohan Singh, constituted the National Knowledge Commission on 13 June 2005 as a think-tank charged with considering possible policy that might sharpen India's comparative advantage in the knowledge-intensive service sectors. This Commission was formed to advise the Prime Minister's Office on policy related to education, research institutes, intellectual property legislation, latest techniques to make working of commission more transparent and reforms needed to make India competitive in the knowledge economy. Accordingly the NKC website was launched in February 2006.

The Terms of Reference of the NKC are:

- "Build excellence in the educational system to meet the knowledge challenges of the 21st century and increase India's competitive advantage in fields of knowledge.
- Promote creation of knowledge in Science and technology laboratories.
- Improve the management of institutions engaged in Intellectual Property Rights.
- Promote knowledge applications in Agriculture and Industry.
- Promote the use of knowledge capabilities in making government an effective, transparent and accountable service provider to the citizen and promote widespread sharing of knowledge to maximize public benefit."

The National Knowledge Commission deliberations have focused on five key areas of the knowledge paradigm – access to knowledge, knowledge concepts, knowledge creation, knowledge application and development of better knowledge services

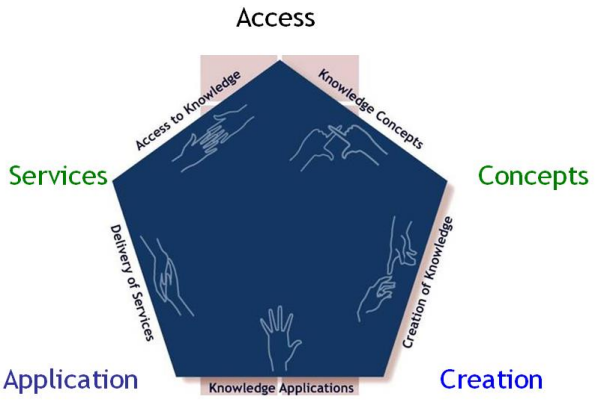

Figure 1: Key areas of the knowledge paradigm by NKC

National Knowledge Commission described knowledge concepts are organized, distributed and transmitted through the education system. It is through education that an individual can make better informed decisions, keep abreast of important issues and trends around him or her and most importantly, question the socio-economic arrangements in a manner that can lead to change and development. NKC's concern with many aspects of the Indian education system covers School Education, Vocational Education, Higher Education, Medical Education, Legal Education, Management Education, Engineering Education, Open and Distance Education, Open Educational Resources, More Talented Students in Maths and Science, More Quality Ph.Ds.

Aswath and Gupta (2009) mentioned that universities are faced with a challenge to create and disseminate knowledge to society. They need to share information and knowledge among the academic community within and outside the institution.

KM has become a key issue in the universities due to changes in knowledge culture. They are not isolated entities but engage in teaching, research and community services. Therefore,

knowledge created in university through research and teaching should be relevant to the society, and promoting knowledge as a major factor of business of the university and higher education institutions. Many Universities like University of Pune already started giving maximum information through their website, websites. (Syllabus, notifications, student's portals, question papers, previous circulars, GR, guidelines, departmental information, etc). Libraries are started developing portal for sharing online available research material to their users. Similarly for the tacit knowledge sharing and collective efforts has to be made at each and every educational institute which is nothing but output to our research community and finally to the nation.

Research Methodology:

Methodology adopted included the survey of Director/Principals, Head of the Departments of Post Graduate or Research centers, Librarians and Post Graduate Students of selected NAAC "A" Colleges in Pune City as per their highest CGPA Scores. The study is also based on observations, Interviews and review of literature in the concern field.

Sample and Data:

The sample of colleges is selected from the list of Accredited Colleges given on National Accreditation and Assessment Council of India website.

Total top 20 "A" Grade Colleges with CGPA score 3.61 to 3.03 selected for this research.

The sample comprises Director/Principal (20), Head of the Departments (Post Graduate) (Approx 100), Librarian (20) and Post Graduate Students (200) from the selected NAAC "A" Grade Colleges in Pune city. The questionnaires are designed separately for each category of sample as per the Annexures attached in this report.

Findings and Observations:

This project is conducted to study the current status of Knowledge Management Practices in the colleges in Pune City. Total 20 "A" Grade Colleges are selected as per their CGPA grade. 18 Colleges participated in the survey. Principal Investigator received 100% response to this survey from Library staff and Students, 72.22% from the Director/Principals and 51.57% responses from the various PG Head of the Departments.

It is been observed that No staff were aware about Knowledge Management concept in higher education but knows it's related to Knowledge in which field they work. After understanding the concept they come to know that they are doing something in this area and find it beneficial for the organizational, personal, individual development and improvement. 1% Principals and 20% Head of the departments agreed that KM is not existence in their college. 79% colleges are involved in these kinds of activities under different heading. 20% colleges are in growth stage of managing knowledge of their institute.

Author quoted earlier the importance of KM in higher educational institutes at college level various opinions are came up like these kind of activity will help college to face various committees and provide data to university, UGC, RUSA and other funding agencies, placement agencies or institutional members. For overall development of institute including staff, students, processes it will help if we exchange the ideas and implement new one. From research point of view activities under KM will be beneficial and help to indulge habit of innovative ideas and research culture among the students and staff. For maintaining academic standard KM evaluation is necessary. For building competency among the human resource and students it is important. Teachers can evaluate students overall performance through these kind of databases. To improve quality of teaching and learning it will help. If these kinds of databases made available to all teachers and students the interaction among them will help. This is a decision making tool so for resources management it will be useful. As per everyone's opinion knowledge is asset of the institution as manpower and their knowledge takes the organization ahead.

99% faculty agreed that it is very much necessary for faculty development and quality improvement. Though college's mentions very selective activities among KM activities but there are many others they can consider and use as KM Strategies that will reflect in the suggestions in this project.

While studying various technologies used by these colleges Internet is used in all colleges' 60% colleges have intranet facility to share and store the information which can be used for KM too. A selected staff member uses Groupware's. One Commerce college uses Ecommerce software for their department. 10% college's uses database management system for managing various databases like library, office, dead stock, equipments, etc at departmental level. But Data ware housing, extranet, KM software's, Decision Support Systems are not yet implemented but looking towards it.

As all colleges are appearing for various committees and applies for various funding agencies they need to give Institutional plan and status in various areas. So it is now necessary to all college to improve knowledge culture, sharing culture and provide such healthy and friendly environment to the employee and students for giving better output. So Colleges started providing knowledge building and sharing environment. Motivation to staff and students to participate in such activities is being promoted.

About who should take this responsibility of KM database so far in all colleges library is maintaining database of explicit knowledge. No separate knowledge manager post there in colleges. Various committees are formed in the colleges for various activities and record keeping they are taking care of that separately. But most of the records are maintained in hard copy. The tacit knowledge captures techniques yet to start in the colleges. They are willing and feel important to keep these records for further reference and quality improvement but no proper guideline there. The guidelines should be provided by the university in this regard.

About the record keeping all colleges keep records in hard written and hard copy form. 21% departments maintain softcopies of project reports along with hard copies. Most of the records are like Annual reports, Committee reports, Departmental Reports, Various databases like students, Marks, Attendance, Prizes, Participants, photos and Activities etc. But no such database of actual tacit knowledge captured and stored. About 80% colleges have not yet taken any initiative in this regard. Hardly 10% departments maintains database of students and staff skills.

All colleges agreed that to strengthen the International collaboration and college-university, Sister Institute collaboration and partnership, to increase employability, faculty development KM database will help institutions.

Class room teaching activities come under knowledge capture and management are Motivating students to participate in PPT presentations, Seminars, Interactions on different topics, Sharing various ideas in their mind, Group discussions, Projects, Assignments, competitions, brainstorming sessions, Hands on

training, counseling sessions, Question answer sessions and Debates. But there can be more.

The attempts made by the colleges to involve staff members to share their knowledge are organizing departmental or get-together meetings frequently, organizes seminar, workshops, conference and also been sent for the same to other national and International organization for participation or paper presentation, give motivation to undertake research and publish papers in research journals, promote them to put up new ideas, organize culture programs and events for staff to bring out talents hidden in them, assign them various roles in various committees to know their efficiency and interest. Few colleges not replied to this question.

To inculcate research interest among the students and bring out their research talents organizations provides hands on training, give freedom to do practical revisions and own experiments, appreciate their projects and practical, involves them in group projects and work together, involve them in research and projects of staff members, motivate them to take practical based, need based, common action based projects and research.

Pune University introduced Knowledge Management board two years back but many non management colleges (Staff) are not aware of that or their activities. No guidelines in this regards are provided by the university to different colleges. Colleges not yet started this because of lack of proper guidelines and its importance and discussion on this. UGC has started content creation projects in which teaching skills are trapped in digital format and make them available to all students in the form of lecture videos, practical tutorials/videos, Demo CDs/DVDs, etc. UGC and University giving focus on digitization of documents but under different headings like institutional repository, content management software, library digital and automation software. If proper guidelines will be provided to colleges in Knowledge repository creation and capturing of tacit, explicit knowledge most of the colleges in Pune City are capable to bring it in practice as they have all resources.

The biggest hurdle in effective implementation of KM in colleges is lack of No Proper guidelines given by the authority in this direction, Lack of understanding of KM and its future benefits, Lack of time to do this activity, Lack of ICT of Software for KB creation, Lack of Manpower, No Determination of what kind of knowledge to be managed and making it available, Changing people's behavior from knowledge hoarding to knowledge sharing, Justifying the use of scarce resources for KM, Lack of top management commitment to KM, etc.

There was varied opinion on who is best person to handle this responsibility. 30% colleges feel that Librarians can do this. 10% colleges thinks its responsibility of placement officer, 20% thinks this responsibility should be go to computer science or IT department head, 3% thinks one of Vice principal should take this responsibility and 30% thinks that separate knowledge manager should be appointed who knows all procedure of KM and KB. 7% college not yet thought about this.

On website of all colleges lots of useful information already updated. Time to time the information is revised. But annual reports, IQAC reports, staff list, achievements, various notices, etc are updated. But the back database folder is maintained by the website designer. Hard copies of all these information maintained in the college. This attempt is started recently after NAAC accreditation process introduced in the colleges. They need to keep updated and also previous years information and knowledge. About knowledge database of tacit knowledge not yet accessible or maintained on websites or intranet.

In the data analysis paragraphs the opinion of the sample colleges regarding what role KM practices can play in educational institutes are discussed. The future plan of colleges in this regards are they are going to set up a committee under Knowledge Management committee, the committee will spread awareness among staff and students about importance or KM and how to maintain the records and access them, Procure software for managing the knowledge base, motivate staff and students to add contents to KB, Promote access to the contents uploaded by the staff and students to all in college at initial stage, provide necessary equipments, infrastructure along with training to staff and students, Involve IT or computer staff members to look at this activity.

While discussing future benefits many good points from staff came up like from the point of institutions for generating academic experts database, for improving results by doing previous years result analysis through result database, for getting recognition to institute at various levels, to get various grants, to improve administrative services, to contribute social corporate and loyal services by studying areas and earlier contribution of the institute in this direction, to have better industry-university-academia –college interaction and collaboration in the form of resources and knowledge sharing, etc. From the point of faculties view for faculty development, adding new faculty, improving performance of existing faculty, improve service capability of faculty and staff, to improve teaching methodologies used by them, to introducing new technologies for innovative teaching practices, improve their responsiveness, giving opportunities for leadership in various activities of college, to give them recognition in society and web, and many other discussed earlier.

From students point of view KM will be beneficial to improve services offered to them, to develop soft skills, research skills, confidence building, to give them exposure to e-tools, laboratories, to give them opportunities to learn from guest faculties invited, to give them recognition, to improve their learning capacity, to improve their responsiveness towards institutes.

Suggestions:

Knowledge building process:

The Knowledge management in higher education is become need of present. Government, UGC and Universities are already has taken initiatives in this directions. In foreign developed country it is in practice now. For the benefit of the institution, faculty and students and quality improvement it is necessary. Now various examinations like NET, SET, Competitive examination are being conducted for lectureship or other professionals. These examinations are nothing but the knowledge analysis techniques. Individual knowledge is analyses by these tests. Applying using the knowledge management techniques and technologies in higher education institutes is as important as it is in the corporate sector. If done effectively, it can lead to better decision-making capabilities, reduced ―product (Example-curriculum development and research) development cycle time, improved academic and administrative services, and reduced costs. Relying on the institutional knowledge of unique individuals can hamper the flexibility and responsiveness of organization. The challenge is to convert the information that currently resides those individuals and make it widely easily available to any faculty,

students, university, placement agencies, international organization and finally globally.

Attempts/Factors to be considered for successful adoption of KM in educational Institutions are:

1. **Understanding KM:** According to Chourides, et al (2003) if organizations wish to implement and succeed in KM adoption they should ensure that the members should be familiar with KM concept. Therefore if colleges or institutes planning to adopt KM they should organize seminars and call experts in this area to give information about KM to people like staff, students and administrators of the institutes. College should take a visit of staff members to corporate sectors or the institutes where KM practices are carried out. It gives them clear idea why KM is important.
2. **Co-ordination:** To carry out any activity successfully there is necessity to coordinate and lead the activity smoothly by coordinating with the team, team members should be motivated and encouraged to participate in this activity. As this is knowledge sharing activity and normal attitude of people is they do not share their knowledge easily. So there should be proper coordination among the staff, students, administrators and technical person for sharing their knowledge, information and skills. So they need to convince it in friendly manner. The skill of KM leader is already mentioned in earlier paragraphs of this report. The successful application of a team work on faculty is possible only if democratic climate is built: tolerance for difference, respect, solidarity, adjustability, responsibility delegation, as well as competences of employees. Teacm work demands sharing knowledge, communication and trust within employees, lecturers and students which defines what faculty's culture enable and nourish.
3. **Motivation:** For KM related activities motivation factor is most important. It is one aid to carry forward this activity. Many times activity just starts and then in course of times it due to lack of motivation that activity stops in between. So people working in this task should always be motivated. If vision and aim is defined strongly then all assignments given to staff and students can be accomplished if motivated them properly. Here role of motivator is very influential..
4. **Culture:** Organizational culture shapes and controls the behavior of the individuals in an organization. Knowledge sharing culture should develop in the organization along with knowledge creation, capture and recording. A Knowledge creating organization does not operate in closed system but in the open system in which knowledge creation is a never ending process, upgrading itself continuously and in which knowledge is constantly exchanged with the outside environment. In Science faculty most of the time until the research gets publish or get patent they do not disclose their research. So in this case the copyright and other issues should be study carefully and can give limited access. But these people can be motivated to share their papers published, practical tips etc. Presentation of such good projects or research work also helps in motivating other people and inspiration to themselves too. For effective functioning it is essential that each institutional division should have freedom to take the knowledge development somewhere else and apply it freely across different levels and boundaries in terms of projects. Internal fluctuation such as frequent rotation of personnel, redundancy of information and requisite variety all facilitate this knowledge transfer. In research organization this has become one best practice. Only strong, consistent culture of learning and entrepreneurial organization can educate, develop and implement knowledge management concept appropriately.
5. **Ability to perform Knowledge Based activities:** As we studied earlier knowledge resides in each individual and they must have ability to share it and apply their efforts within the organization. So the team working on KM including teachers and students should have to improve their ability to share their knowledge as well as capture others knowledge. For this they need to improve their communication skill so that by discussing and communicating and through various activities they can achieve their goal.
6. **Technology:** Now for easy implementation of any activity technology plays major role. In corporate various technologies are used for KM activities. As this is a kind of database activity huge data needs to capture and store. There are many offline as well as web based KM software available free of cost as well as paid for example Confluence ,Traction TeamPage, Column Case Management , Zendesk, Bitrix24, Novo Knowledge Base Software, Fuze Suite, Archivd Research, AlwaySupport, Correlate K-Map, KnowledgeXChanger, KBPublisher, KPS Knowledge, Management Software, APTEAN Knowledge Management, BMC Knowledge Management, Certified TWiki OnSite, Comm100 Knowledge Base, DoyleSoft Knowledge Base, Eloquent Librarian, Interspire Knowledge Manager, intraLibrary, Knowledge Management System, Knowledge Based Support, Knowledge Agent, Knowledgebase Manager Pro, XPERT Knowledge, Etc. Along with ERP softwares like NETSUIT, Evo-ERP, Intacct, available in the Indian Market. At initial stage college can use the simple content management softwares like Zhoomla, Eprint, ABCD, Drupal, Greenstone, Dspace available online free of cost.

Use of ICT for knowledge management is very much necessary in higher education. It is been observed that in education sector still use of various ICT tools and applications are not being used. Now web technology, web tools plays major role in capturing and sharing tacit knowledge of students and teachers. Web 2.0 is very famous phenomenon specifically in higher education (McLoughlin and Lee 2007). Web 2.0 is the development of modular information services, where developers and users are able to build applications from practical modules. The web 2.0 technologies provide such platform where creators as well as users can use them according to their specific purpose in different fields of life. With respect to ICT, we can realize the fast expansion and creation of technologies that are less about "narrowcasting", and more focused on creating communities in which people come together to collaborate, learn and share knowledge. According to Owen et al. (2006), in this higher education arena, there are shifts in the views of what education is for, with a growing emphasis on the need to enable and support not only the acquisition of knowledge and information but also to develop the skills and resources to support knowledge based economy and learning throughout life.

The role of web 2.0 technologies has become the windfall gain for knowledge building in higher education in the modern world. Web 2.0 technologies (Podcasts, Wikis, and Blogs) are being explored for collaboration, innovation, and creative purposes in digital literacy. These are read/write technologies; users can access the information through them by using internet as well as write the information over the internet. Use of these technologies can improve the creative skills among the students as well as teachers. The Information and Communication Technologies based systems (Learning Management System, Student Portal, Web mail) of Växjö University lack web 2.0 technologies (Podcasts, Blogs, and

Wikis) that are important in the classroom learning for knowledge building.

The open access tools like social networks, survey tools like survey monkey, Google applications like sites, blogs, emails, spreadsheets, scholar, drive, facebook, twitter, Linkedin, Researchgate, and many more. But the uses of such tools for knowledge management activities are found very less.

The main three functions of higher educational/ academic institutes are Knowledge creation, knowledge spreading among the staff and students, academic service to the society and environment in which process of transferring this knowledge to society including the economy. Through this function academic institute should bridge gap between the research results and possible implications of those results on economy of society as a whole.

Author has created one model to show this research or knowledge management process. It shows Teachers gives knowledge to students. Student and teachers interact and share knowledge amongst them. They create new knowledge in the form of research project, articles, patents, activities, results etc. which finally shared with society. Students implement their knowledge at their work place and from society again this knowledge reaches to education system. This cycle continues. This is continuous teaching and learning, knowledge building process.

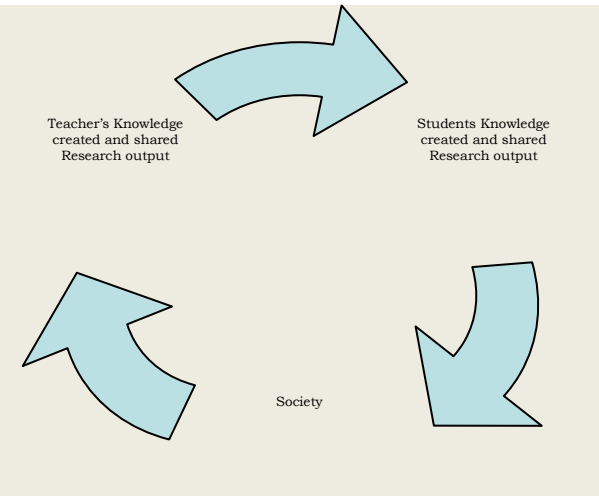

Figure 4: Knowledge Management process in higher education institute

Knowledge Management Techniques and Strategies: Creation of knowledge in an educational process is a continual and dynamic interaction between tacit and explicit knowledge of professors and students. Professors does not serve only as a source and information transmitter but as an organizer of learning process which involves active construction and reconstruction of knowledge and not just memorizing it but bring that in practice and implement. Organizing projects in teaching process and generally at faculty and students level is an effective way of realization of managing knowledge of professors and students.

Projects: As discussed above the tacit knowledge of students through brainstorming, discussions, debate, team work, competitions, seminars, problems, assignments and other activities teachers make them to exchange their non formulated knowledge and analyze it through project assignments. In this way students can convert their tacit knowledge into explicit one in the form of new concept. Students check the possibilities of realization of problems and then work for finding solutions.

Communication i.e. dialogue between professor and students, as well as among students is essential in knowledge or new ideas generation process. Communication presents the ratio of as many logical thoughts as there are participants in it. Participants use their communication to reconstruct the logic of the transmitter and then translate it in their own logic. Sometimes mutual judgments provide necessary feedback in finalizing permanent correction in new creation. In this process the result is new creation, new ideas and student's standpoints on the discussed topic.

Suggested Knowledge Management Process:

As we discussed earlier the basic process of KM is Knowledge gathering or acquisition, Knowledge creation/ capture, Knowledge storage and organization, Knowledge distribution and then Knowledge application. In educational institute's teachers and students can gather the knowledge through various resources like library reading material, databases, internet, newspapers, classroom teaching and learning, etc. New knowledge can be created and captured by using techniques and strategies are discussed above. The next step is knowledge organization and storage. Here in this process as every institute have thousands of students, hundreds of teachers. Managing knowledge of all these people by an individual person or group of person is difficult task and the data size will be very huge. So here the principal investigator suggests that in academic institute role of every individual or contributor is important. Everyone is manager of their own knowledge. KM in educational institute is team work with different roles. There should be multiuse software of KM or content management or ERP in the institute to manage the KB.

The training and proper guidelines should be circulated among the staff and students. There should be separate sessions on KM to people playing different roles in this process. Each individual in the academic institute which is actually knowledge house is a knowledge acquirer and creators. After acquiring the knowledge he or she creates new ideas and knowledge in various forms. As discussed above through various projects, activities, competitions, brainstorming sessions, debates, discussions, practical etc knowledge creates which has to be recorded properly in digital form using scanners, recorders, computers, cameras, social networks, LCD projectors, digital pen, diary. It is every staff and student's duty to store or represent their tacit as well as explicit knowledge in communicable form. In the software there should be separate platform under separate heading for different category of people like HODs, Teachers, Administrators, Students etc to store or add knowledge to knowledge base. There might be different databases like article database, picture database, videos database, notices database, activities database, question bank, answer bank, result database, students' database, teachers' database, talent database, specialization database, etc. All these databases are created by staff and students. They can upload their knowledge in the form of files. This can be done at done at departmental level too.

Once the recorded knowledge is added in the database it is necessary to classify each and every file. If the database is maintained department wise then one person in each department has to train in classifying the records. After classifying each record needs to be indexed with keywords to make it searchable. Proper training of classification and indexing should be given to the concern staff of that department. That staff will scrutinize uploads or newly added data and will have rights to add to main knowledge base and can assign the accessibility (Departmental

level, individual level, intranet, internet, etc) this person will verify the copyright issue of that document. So the person from every department who is administrator of Knowledge database of that department needs training on software implementation, database management, classification, indexing and copyright issues. The administrators can be individual class teachers who will maintain the knowledge base of their class.

At Departmental level Head of the department will look after their departmental teachers' knowledge base. Individual Teachers can manage (classify and indexed) their own knowledge in the knowledge database. Class teachers can check the knowledge database of students.

Conclusion:

Higher education is a center of knowledge creating, delivering, and learning for society. On international level too knowledge sharing policies between two and more countries are going on. For the development of nation it is must. Discussions and exchange of information is very common among staff, students and scholars now a day. This is the base for the generation of innovative concepts. Through open access movement everyone is able to access the information through internet. But at local and institutional level attempts are required for capturing tacit knowledge of individuals and sharing for new vision. Open Access initiative is boon to researchers and if at every organizational level the better management, use and sharing of available resources/knowledge both explicit and tacit occur it leads to overall development of educational system and nation at fast speed. Knowledge plays a crucial role in the progression of institutions. The process of knowledge sharing plays a significant role in determining the outcomes of knowledge management in institution. Universities and colleges are the core producers of new science. So at every organizational level such attempt has to be made for the benefit of working team and society.

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