

Sustainable Research Culture for Enhancing the Quality of Deliverables in Classroom Teaching-Learning Environment : An In-Depth Analysis

* *D. K. Choudhury*

Abstract

In higher and technical education institutions across the globe, teaching and research complement and supplement each other, which leads to enhanced quality of deliverables in classrooms and constitutes a chain on the pattern of the supply chain in industry. Each and every component of the chain is linked and integrated with each other in such a fashion that it becomes unreasonable to think about any of the components without considering the importance of others. Naturally, the faculty inherits an institutional culture, whatsoever it may be, and often contributes to enrich and strengthen the existing culture or else create a new culture, which is more coherent with the short and long-term objectives of an institution. However, in the absence of an institution's culture, the faculty try to develop a particular culture required for fulfilling the set objectives and ultimate goals of the institution. In the backdrop of the prevailing teaching and learning scenario in the country, what sort of research culture is expected to prevail in an institution has been studied in detail in different interfacing contexts. The present study is, therefore, a modest attempt to analyze how the research culture can be created in an academic institution not only for enhancing, but also for sustaining the quality of deliverables through effective classroom teaching-learning environment supported by proactive involvement and participation of students in such endeavours.

Keywords : Research culture, institution, education, deliverables, class-room environment, class-room teaching

JEL Classification: I21, I23, I28

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Universally education has been considered as an extremely powerful tool for peaceful social and economic transformation of the society and the nation. While the primary and secondary level education helps in creating and cementing a sound base for the all round development of the personality of growing individuals; higher and technical educational institutions play a pivotal role in knowledge creation and knowledge dissemination necessary for strengthening and diversifying the intellectual capital of the country enabling to successfully handle not only the present set of responsibilities but also preparing them to shoulder the ever emerging and challenging responsibilities as the future unfolds itself. Teaching, research and extension activities are the three major components of higher education.

It is evident that while with the increasing participation of private players there have been a phenomenal growth in the spread of higher and technical education institutions across the country; but somehow research did not receive the desired focus and attention. Therefore, knowledge creation in the country primarily through breakthrough and fundamental research is not much in the sight. Even in the applied research domain, our attainments are again nowhere close to the international standards because of the fact that our educational

* *Dean & Professor, Gitarattan International Business School, PSP 2A & 2B - Complex-II, Madhuban Chowk, Rohini, New Delhi - 110 085. Email :dkc.ashokvihar@gmail.com*

institutions, especially the higher and technical education institutions seriously lack research culture. Sporadic incidences of Indian research contributions attracting world's attention and recognition are again very rare. This calls for a serious and critical introspection by all stakeholders so as to take appropriate policy decisions and all remedial measures to turn the table upside down.

Jana Hackathorn¹ et al.(2011) narrated that traditionally, college lectures consist of teachers' verbally communicating information to the students, and students passively receiving and encoding it in their memories. Many recent studies suggest that the passive method may not be the most effective way for students to learn. Rather, current research advocates for teaching techniques that encourage students to actively engage in the material because classroom engagement has been found to promote deeper levels of thinking and better facilitate encoding, storage, and retrieval than traditional lecture. Consequently, it is likely that most instructors attempt to incorporate techniques that involve the students and get students thinking about and applying the material. Instructors have used elaborate demonstrations, structured activities, journaling, small group discussions, quizzes, interactive lecture cues, videos, humorous stories, taking field trips, and games, to get students involved and active in the learning process (Cook & Hazelwood, 2002 ; Hackathorn, et al., 2010; Michel et al., 2009; Peck, et al., 2006 ; Sarason& Banbury, 2004).

From an innovation point of view, active teaching techniques change the pace of the classroom, and are a creative way to increase students' involvement, motivation, excitement, attention, and perceived helpfulness and applicability of the class (Binek-Rivera & Mathews, 2004; Guthrie & Cox, 2001; Stewart-Wingfield & Black, 2005). Arguably, the most active teaching technique is the in-class activity (Whetten& Clark, 1996)which involves all of the students in the class, either working in groups or alone, to solve a problem or puzzle.

Today in a fast paced dynamic environment, scientific, and technological developments and advancements are challenging the hitherto conventional knowledge, beliefs, and value systems. In the fast-packed environment, society cannot remain aloof and hence is expected to keep itself abreast with the latest developments in the domains of knowledge and information technology through continuous studies and latest research findings. Similarly, the academic fraternity, an integral part of the society, is also required to keep abreast its existing knowledge reservoir. Since besides teaching and extension, research is another important component of higher and technical education; it is therefore utmost necessary to create, establish and sustain a research culture in academic institutions so as to complement and supplement teaching and extension endeavors and create and disseminate knowledge. However, developing a research culture in an institution will call for certain pre-requisites necessarily to be effectively met by the institutions concerned.

Research Culture

Research is the systematic generation of new knowledge i.e. development of new ideas and experiment with the new techniques. Generally research, a quest for truth, involves either searching for or reviewing or evaluating information on scientific lines. According to Robin Hill(1999), research culture in an academic institution is a well conceived structure that reflects the underlying philosophy, values and beliefs about the research within an organizational set up. Further, it finds reflection in the research behaviours, research actions and research symbols of the organization ; just as 'teaching values and styles' is a mirror image of the 'teaching culture' of an institution, and the 'management culture' is found embedded in the 'managerial values and styles. The research culture allows understanding, undertaking and evaluating research activities in the institution and this entire exercise is firmly based on the scientific temper and conduct of the faculty facilitating transfer of knowledge to students not only in the context of today's expectations of the society but also to develop an analytical bend in their minds enabling to cross-examine evidences in the context of tomorrow. Thus, the research culture, the cornerstone in the overall image of an institution, is a mirror image of the totality of research values and styles, the management, faculty and the students attach to it.

Hill (1999) pointed out that the research culture reflects the values, ideals and beliefs about research within the organization. They, in turn, are reflected in the research behaviours, research actions and research symbols of the organization. Just as the “teaching culture” of the institution is found in the teaching values and styles, and the “management culture” found in the managerial values and styles then the “research culture” would reflect the research values and styles.

Research culture refers to a pattern of basic assumptions about research. Not only is it the study of what researchers do, but why they do it. When we speak of why, at one level we may find ourselves discussing their motives, but at a higher level we may find ourselves discussing their overriding values and philosophy of research. In research terms, the lowest in the hierarchy that defines “research values” are research goals, which have short-term, immediate intended outcomes. Next, research objectives lie in the middle regions of the hierarchy, and are long-term intended outcomes. Highest of all are research ideals which are ultimate pursuits, which may or may not be attained but which are deemed worthwhile pursuing all the same. This entire system is reflected in the roles that individuals engage in as researchers.

Serious indulgence in research to create a 'research culture' in an institution is necessary as research contributions of an institution are one of the important parameters for assessing the quality status of its academic working. Moreover, since research is the intellectual life blood of faculty, therefore faculty should supplement and complement teaching-learning endeavors of the institution and also support community and the society through its valuable research contributions.

For preparing classroom teaching deliverables, each institution may be considered as an input – output system; wherein the library resources, infrastructural facilities, teaching faculties and other deliverables are the inputs to the system and the passing out final year students is the system output. One may classify the quality of output as 'excellent', 'very good', 'good', 'average' and even 'below average'. Since this output is generated by the inputs provided by the system, one can state that while the quality of the library resources and the infrastructural facilities are also important inputs but undoubtedly the intellectual capital of the faculty and the quality of classroom deliverables are primarily responsible for generating better quality outputs. Therefore, continuous research and re-engineering processes within the institution are required to improve upon deliverables meeting requirements of the subject curriculum. More the institution attempts to continuously improve upon its deliverables, better will be the quality of its outputs.

Kaur et al.(2015) stated that in education sector, simply being knowledgeable does not give a teacher enough weight to ascertain himself as an effective teacher. The researchers found through their research work that it is now more if not equally important to apply flexible methods in disseminating the knowledge in a more innovative and interesting manner and social media provides one such popular platform to make teaching and learning more flexible, effective, and enjoyable.

Xinying et al.(2015) argued that the research-based teaching curriculum emphasizes on promoting students' subjective ability. This kind of teaching mode is beneficial for improving students' subjective consciousness, and stimulating students' interests in learning, and cultivating students' research and practice ability and innovative spirit, cooperation and developing consciousness. This is helpful to promote the good interaction of teachers' scientific research and teaching effect.

Research Objectives and Methodology

The objectives of the present study were to find out that :

- (i) What constitutes research culture in an institution and how it can be created and accelerated;
- (ii) What are the deliverables in the context of classroom teaching; and

(iii) How the research culture in the institution may help in preparing best deliverables for effective classroom teaching-learning and better understanding of the students.

(1) Universe, Sample Size, and the Sampling Procedure : Primary data for the study was collected with the help of a self-constructed and pilot tested research questionnaire, and secondary data was collected from available literature. Primary data collected through the questionnaire (Appendix 1) was about various teaching techniques and pedagogies used by the faculty in the classroom teaching-learning environment. Opinion of the faculty of different Delhi based academic institutions was also collected to corroborate and supplement primary and the secondary data.

(2) Data Analysis : Research Tool - Pareto Analysis : Pareto Analysis, a decision making statistical technique was used by Faisal Talib et al. (2010) for selecting limited number of tasks that produce overall significant effect. It ranks data/factors in the descending order from the highest frequency of occurrences to the lowest frequency of occurrences. The total frequency is summed to 100%. The “vital few” items occupy a substantial amount (80 %) of the cumulative percentage of frequency of occurrences and the “useful many” occupy only the remaining 20 % of frequency of occurrences. This is also known as the 80-20 Rule developed by Vilfredo Pareto, an Italian Economist. The results of the Pareto analysis are represented through a Pareto Chart. The Chart represents various factors under consideration in a ranked order. Presentation of Chart is in the form of a bar graph in descending order, which helps to predict the 'vital few' factors and provides a clear indication after superimposing a line graph that cuts an 80 percent cumulative percentage. This also helps in determining those factors which have least amount of benefits and vice-versa.

Pareto Analysis was carried out for choosing 'teaching techniques' used in delivering lectures in classrooms. This was done in descending order based on the number of frequencies obtained from the outcome of the research survey. The Pareto Chart helped in investigating and proposing a final list of “vital few” 'teaching techniques' which could benefit researchers and practitioners in educational institutions.

Present Trend of Research in India

Academic research in India is mainly promoted by three statutory bodies, namely, University Grants Commission (UGC), All India Council for Technical Education (AICTE), and the Indian Council of Social Sciences Research (ICSSR). While UGC and AICTE are primarily responsible to coordinate, monitor and maintain standards in higher and technical education across the country and build and augment capacities and capabilities of institutions under various schemes through Plan and Non-Plan grants-in-aid support for carrying out various academic activities including research; ICSSR. These policy support measures have facilitated and accelerated growth and development of higher and technical education as well as promotion of research in social sciences and thus made significant contribution in the development of the nation to a very great extent.

(1) Promotion of Research by University Grants Commission (UGC) : Since its inception, UGC has been striving hard to promote teaching and research in emerging areas in the disciplines of humanities, social sciences, languages, literature, pure sciences, engineering and technology, pharmacy, medical, agriculture science etc. with liberal financial support even to inter-disciplinary areas such as history of science, Asian philosophy, health, environment, stress management, bio-technology, nanotechnology, and many other identified emerging areas. Though the schemes of support to faculty to undertake minor and major research projects, in addition to their teaching responsibilities have delivered well but only in certain selected pockets of the country. Invariably non-availability of competent faculty, lack of system support etc. have been identified as major constraints. Moreover,

Table 1. Number of Research Proposals and Total Grant Approved in XII Plan Period

Grant released during XII Plan (01.04.2012 - 31.03.2015)			
Sl. No.	UGC Regional Offices	No. of beneficiaries(Teachers)	Total grant released (₹ in crores)
(1)	(2)	(3)	(4)
1	UGC-ERO, Kolkata	3047	37.48
2	UGC-SWRO Bangalore	4671	38.85
3	UGC-NERO Guwahati	1235	21.98
4	UGC-SERO Hyderabad	236	39.34
5	UGC-CRO, Bhopal	1267	12.22
6	UGC-WRO, Pune	3560	24.63
7	UGC-NRCB, New Delhi	206	0.74
TOTAL :		14222	175.24

Source : Annual Report of UGC

lack of proper co-ordination between and among various stakeholders; non-proportionate teaching work load, non-supportive working environment, delay in completion of projects and their poor quality, and also delays in release of grants by UGC often diluted the basic objectives of these schemes. Absence of effective and responsive inbuilt monitoring mechanism and lack of good research proposals on account of poor knowledge of research methodology as well as applications of statistical tools and techniques for data processing often resulted either into repetitiveness in research topics or value addition to the existing body of knowledge. Publication of the findings of such projects in referred research journals is again extremely rare.

Status of quantum of grants approved by UGC Regional Offices including Northern Regional Colleges Bureau (NRCB) towards Minor Research Projects (Sciences)during the Eleventh Plan Period (2007-12)is given in Table 1. Status of quantum of grants approved by UGC Regional Offices including Northern Regional Colleges Bureau (NRCB) towards Minor Research Projects (Humanities, Social Sciences and Sciences)during theXII Plan Period is given in Table 1. Project-wise financial assistance towards Major Research Projects in 'Humanities and Social Sciences', and towards 'Sciences including Engineering and Technology, Pharmacy and Agriculture etc'.is limited to ₹ 15.00 lakhs and ₹ 20.00 lakhs, respectively.

During the year 2014-2015, 1017 new projects were recommended and the mid-term evaluation was also done for 1473 ongoing projects of 2013, out of which the progress of 44 projects was not found satisfactory. The details of major project proposals received under different disciplines vis-à-vis grant released is furnished in the Table 2.

(2) Research Workshops/Symposia and Conferences in Colleges : In addition to supporting minor and major research project proposals, UGC supports conduct of national and international level

Table 2. Status of Funding to Major Research Projects in the Year 2014-2015

Sl. No.	Faculty	No. of proposals during 2014-2015	No. of projects recommended	Grants released (₹ In crores)
1	Major research projects in Science, Engineering including Pharmacy and Medical	2164	603	31.31
2	Humanities, Social Sciences, and Languages	1186	414	16.39
3	Total	3350	1017	47.70

Source : Annual Report of UGC

Table 3. Details of Proposals & Grants Released by UGC for Workshops, Seminars, Etc.

Sl. No.	State / U.T	No. of beneficiaries (colleges) during (2014-2015)	Total grant released (₹ in crores) 2014-2015	No. of beneficiaries (colleges) during 2012-2015 (XII Plan)	Total grant released (₹ in crores) during 2012-2015 (XII Plan)
(1)	(2)	(3)	(4)	(5)	(6)
1	UGC-ERO, Kolkata	234	3.51	466	9.85
2	UGC-SWRO Bangalore	1150	6.98	2210	18.56
3	UGC-NERO Guwahati	142	1.97	429	5.93
4	UGC-SERO Hyderabad	215	2.76	267	7.80
5	UGC-CRO, Bhopal	143	2.31	222	4.59
6	UGC-WRO, Pune	501	3.45	2349	13.98
7	UGC-NRCB, New Delhi	70	0.6	246	1.09
TOTAL :		2455	21.58	6189	61.8

Source : Annual Report of UGC

Table 4. Grant Paid by UGC for Faculty Development Programme in 2014-2015

Sl. No.	State / U.T	Grant released 2014-2015		Grant released during XII Plan (01.04.2012 - 31.03.2015)	
		No. of beneficiaries (Teachers)	Grant released (₹ in crores)	No. of beneficiaries (Teachers)	Grant released (₹ in crores)
1	UGC-ERO, Kolkata	164	3.45	384	8.48
2	UGC-SWRO Bangalore	764	15.65	2487	41.20
3	UGC-NERO Guwahati	192	5.79	454	11.23
4	UGC-SERO Hyderabad	53	1.19	53	8.52
5	UGC-CRO, Bhopal	125	1.96	339	4.32
6	UGC-WRO, Pune	150	5.97	882	18.32
7	UGC-NRCB, New Delhi	25	0.3	146	1.64
TOTAL :		1473	34.31	4745	93.71

Source : Annual Report of UGC

workshops/seminars/symposia/conferences in various fields to provide forums to teachers and researchers for sharing their knowledge, experiences and research findings. Details of proposals received, grants released by UGC Regional Offices/Bureau to colleges under the Scheme during the period 2014-2015 and under XII plan are given in Table 3.

(3) Faculty Development Programme : The UGC gives grants to different colleges for enhancing the academic and intellectual environment in the institutions by providing faculty members with enough opportunities to pursue research. The participation in such programmes enable faculty members to update their research and pedagogical skill. The Table 4 depicts the grant paid by the UGC Regional offices under this programme during 2014-2015.

(4) Research Promotion Schemes of AICTE : AICTE promotes and supports research activities in institutes under its different schemes, namely, Research Promotion Scheme, Faculty Development Program, Developing Research Park in the Institute, and Seminar, Symposium and Workshop Grant. Assistance under these schemes is

Table 5. An Overview of Research Promotion Schemes of AICTE

Parameters	Schemes			
	Research Park	Research Promotion Scheme	Seminar, Symposium, and Workshop	Faculty Development Program
(1)	(2)	(3)	(4)	(5)
Duration of the project	Three years	Three years	-	Two weeks
Limit of funding to an institute	₹ one crore	₹ 25 lakh	₹ 5 lakh	₹ 5 lakh
Expected outcomes	Transfer of knowledge from academic institutions to industries	Create and update general research capabilities.	Provide forum for interaction of academicians, sharing of innovations and inventions.	Promote quality of faculties.

subject to fulfilment of the stipulated criteria and conditions. The Table 5 presents an overview of these schemes of the AICTE.

Table 6. State-Wise Disbursement of Grant by AICTE Under the Research Promotion Scheme

Sl.No.	State	No. of Proposals Sanctioned	Grants disbursed (₹ in Lakhs)
(1)	(2)	(3)	(4)
1.	Andhra Pradesh	55	608.04
2.	Assam	25	261.08
3.	Chandigarh	03	45.25
4.	Chhattisgarh	07	87.24
5.	Delhi	04	55.98
6.	Gujarat	19	144.13
7.	Haryana	08	103.69
8.	J & K	01	05.00
9.	Jharkhand	01	20.00
10.	Karnataka	29	282.63
11.	Kerala	07	78.49
12.	Madhya Pradesh	27	342.22
13.	Maharashtra	49	680.35
14.	Manipur	01	14.20
15.	Odisha	06	83.50
16.	Pondicherry	04	34.84
17.	Punjab	26	217.24
18.	Rajasthan	08	126.04
19.	Sikkim	07	88.88
20.	Tamil Nadu	75	435.65
21.	Tripura	15	192.20
22.	Uttar Pradesh	06	117.65
23.	Uttarakhand	33	36.20
24.	West Bengal	88	88.34
TOTAL		504	4,180.84

Source: AICTE's Annual Report 2011-2012

The Research Promotion Scheme(RPS)aims to create research ambience by promoting research in technical disciplines and innovations in established and emerging technologies. The main objective of theScheme is to create and update general research capabilities of the faculty of various technical institutes. State- wise disbursement of grant under the Scheme for 2011-2012 is shown in Table 6.

(5) Promotion of Research by Ministry of Human Resources Development : The MHRD also promote research in various fields. The Ministry allocated ₹ 230 crores for Research Projects in the financial year 2012-2013.Two more Research Parks apart from IIT Madras have been approved, one each at IIT Bombay and IIT Kharagpur with an allocation of ₹ 100 crore each. The objective of the Research Parks is to create a Knowledge and Innovation Ecosystem through collaboration between industry and academia to enable, encourage and develop cutting edge technology and innovation that exceeds the global standard.

(6) Promotion of Research by Planning Commission : Research Division of Planning Commission deals with a Plan Scheme of Research & Study for supporting Studies and Investigations in Planning Methodology with grants-in-aid to Universities / Research Institutions for undertaking research studies and organizing Seminars & Conferences, which are relevant for the programmes and policies of the Planning Commission. The scheme has provision for funding publications as well. The objective of the scheme is to stimulate and encourage research and studies that are considered necessary for enhancing the understanding as regards Plan Formulation, future requirements for Planning - both short term and long term. It is also aimed at developing the process of implementation of plans and programmes and the need for redefining them to suit the objectives of the planning process, conducting socio-economic studies, studying the plans and policies of the country in the context of international economic environment and such other processes as may be deemed fit.

This scheme aims at obtaining inputs from academic institutions and other stakeholders for the ongoing planning process. Grants-in-aid amounting to ₹ 208.68 lakh were released during the year 2012-13 comprising ₹ 118.16 lakh on Studies and ₹ 90.52 lakh on Seminars / Workshops. The RE for the year 2013-14 was ₹ 210.00 lakh. Proposals for grant-in-aid for - 1 study and 32 Seminars were approved during 2012- 13.

(7) Promotion of Research by TATA TRUST : The trusts have promoted, and continue to support, several institutions of learning, research and culture in India. These include the Indian Institute of Science, Bengaluru ; the Tata Institute of Social Sciences, Mumbai ; the Tata Memorial Centre, Mumbai ; the Tata Institute of Fundamental Research, Mumbai; the Tata Medical Center, Kolkata; the National Institute of Advanced Studies, Bengaluru; and the National Centre for the Performing Arts, Mumbai. The trusts have also helped in establishing the JRD Tata Ecotechnology Centre, Chennai.

(8) Research Promotion by National Council of Educational Research and Training (NCERT) : NCERT conduct a variety of innovative research, development, and training and extension programs along with various other programs. The Council also conduct several researches in priority areas in school education and teacher education and provide support for educational research through Educational Research and Innovations Committee (ERIC). ERIC acts as a catalytic agent in promoting and supporting research in identified priority areas within school and teacher education. It also identifies and publishes priority areas of research from time to time. Since its inception, more than 500 researches have been completed with ERIC support. With the objective to provide opportunities to young scholars to conduct research in the field of education from multi-disciplinary perspective and build the knowledge base of education in the contemporary context, NCERT started Doctoral Fellowship Program in 2007 offering 10 fellowships every year.

(9) Research Promotion by National University of Educational Planning and Administration (NUEPA) : The National University conducts professional activities relating to its core functions and programmatic priorities. Key activities include programs of teaching and professional development, research and evaluation, technical support to national and state governments, documentation and dissemination services, and consultancy services to national and international agencies, networking and international collaboration. Teaching programs include pre-doctoral (M.Phil), doctoral (Ph.D.) and post-doctoral programs designed to develop a critical mass of well-trained researchers and young professionals in the areas of educational policy, planning and administration. University has been undertaking, aiding and promoting inter-disciplinary research and studies with particular focus on educational policy, planning and management to generate new knowledge for formulation of evidence-based policy options and strategies to ensure achievement of education sector development goals. University undertakes both quantitative and qualitative research, review and evaluation of existing policies, plans and programs, comparative studies in educational planning techniques and administrative structures and procedures in different states of India and in other countries. During 2011-12, 14 research studies were completed while 17 studies were in progress. NUEPA approved ₹ 137.31 crores under grant-in-aid in 2011-12 for organizing various seminars, conferences and workshops in the country by different institutions.

Deliverables

The facts, concepts, and ideas which are conveyed to the students in the classroom in the form of information are called deliverables. Through these deliverables faculty tickle the mind of the students, increase their curiosity, attract their attention and thus inspire them to learn. It is the quality of deliverables which creates the joy for learning within the students. It is about a learning exploration with students and sharing with them a story that means something. With the help of these deliverables, faculty convey all required information to students for understanding the subject. Information are processed and internalized by students and converted into knowledge which is saved in the brain.

While interacting with students in classes, faculty continuously go on passing information and students at the receiving end seems to try to internalize these and store in their brain. So, it may be of interest to know about the memory capacity of human brain. Is there a physical limit to the amount of information it can store? The retention power of the information in the brain of the human beings differs from person to person. The human brain consists of about one billion neurons. Each neuron forms about 1,000 connections to other neurons, amounting to more than a trillion connections. If each neuron could only help store a single memory, running out of space would be a problem. One might have only a few gigabytes of storage space, similar to the space in an iPod or a USB flash drive. When neurons combine, each one helps on creating space for many memories at a time, exponentially increasing the brain's memory storage capacity to something closer to around 2.5 petabytes (or a million gigabytes). For comparison, if brain works like a digital video recorder in a television, 2.5 petabytes would be enough to hold three million hours of TV shows i.e. leave TV running continuously for more than 300 years to use up all that storage (Reber, 2010).

The brain's exact storage capacity for memories is difficult to calculate. First, we do not know how to measure the size of a memory. Second, certain memories involve more details and thus take up more space; other memories are forgotten and thus free up space. Additionally, some information is just not worth remembering in the first place. But, perhaps it has been experienced by us that by memorizing any stored information on regular basis, there is a fairly good chance of retaining that particular information in the memory till one continues the practice. Otherwise, it fades gradually. Secondly, it is felt that the grasping and memorizing capacity of the students can perhaps be enhanced by:

- (i) Making deliverables easy to understand and interesting;

- (ii) Citing examples from real life situations;
- (iii) Explaining concepts to the extent possible with the help of pictures or diagrams; and
- (iv) Creating excellent academic ambiance in classroom.

More the students listen to faculty patiently in a calm and quite environment, chances of receiving information and getting it stored in brain becomes more. So in classroom teaching, two important factors play vital role - first is the quality of deliverables, which is responsible for attracting and retaining the attention of students, and second the pedagogy used in delivering lectures in classrooms.

(1) Improving Lecturing Ability : Good lecture means how effectively the subject matter has been framed and conveyed to target audience(students) so that it connects the speaker and the listener so much so that the content of speech becomes easily understandable and digestible and thus creates interest among listeners. The following processes may help to improve lecturing ability :

(i) Self Evaluation of Own Lectures : In this process, faculty records its own lectures delivered in class and then listen recording carefully and notice all the shortfalls e.g. the extent to which the information delivered could have been well received by students and improve delivery next time.

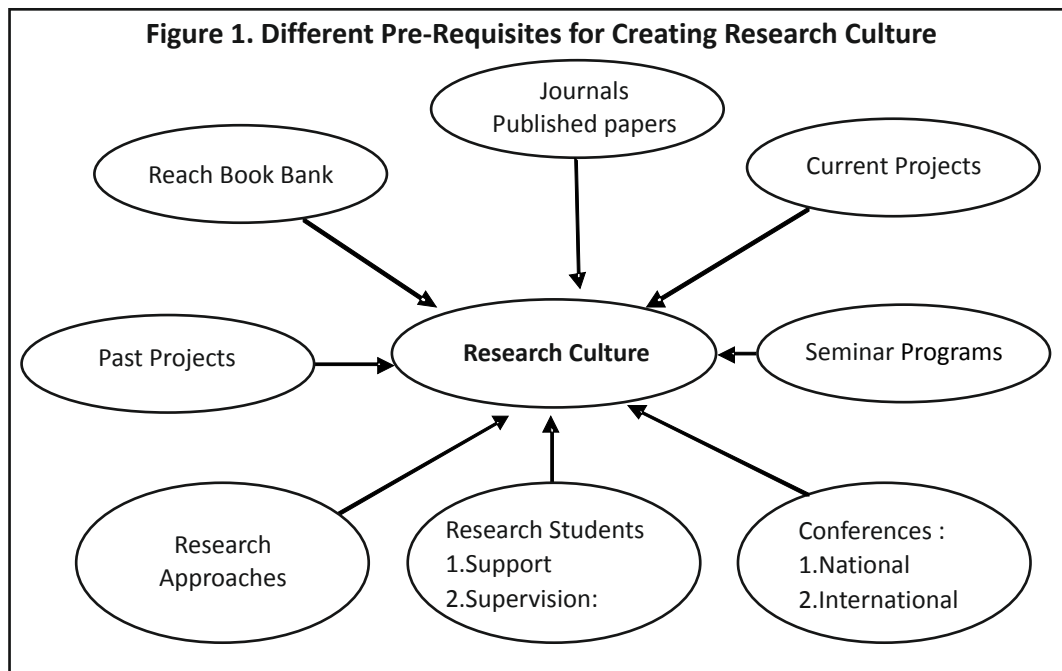
(ii) Listening to Good Classroom Lectures Delivered by Renowned Professors : These days many classroom lectures are available in U-tube. One may listen to those videos carefully and explore possibility of using good practices that come to notice. By doing so, one may benchmark himself against certain identified criteria. Finding out possible shortcomings in such video presentations would help in avoiding the same by faculty.

(iii) Innovating New Practices : One cannot become a great chess player just by watching and reflecting recorded games of different renowned chess players. Therefore to become great, one should be innovative to develop his own new style and technique. Same holds good in case of teaching also. One should think for better way of delivering topics and in this process should try new methodology and apply those in classroom. One needs to explore, experiment and continuously practice new teaching pedagogy to find right algorithm(s) that push students into action and bring joy in learning.

(iv) Feedback from Students : Objective feedback is a very important tool to improve deliverables. At the end of the class, students may be asked to write on a piece of paper the things they learned or liked most in the lecture, concepts etc. and also what they could not understand or the areas that call for further improvements. In this process, one may expect constructive feedback from students, which matters a lot in learning process, only if faculty in an honest way make students feel safe and valued. Little negative feedback hurting crumbling ego of faculty should not be taken too seriously as negative feedback be taken as the stepping stones in the journey to improve teaching.

(2) Need for Creating Research Culture : For the purpose of enhancing quality of deliverables, a self-sustainable research culture is to be created in the institute. However, for creating such a research culture, the pre-requisites as presented in Figure 1 are required to be made available in the institution.

(i) Collection of Journals & Publication in Journals : An institution must have a very good collection of research journals to facilitate faculty and students to go through the latest updates in different fields. Faculty needs to regularly update themselves with the latest developments taking place in a particular field and be able to pass on



such information to students in classroom teaching. Students on the other hand should be able to consult different journals for extracting data while doing research projects.

Choosing a journal for publishing of research is a common dilemma faced by many researchers after completing his/her research. It is important to note that most Indian researchers conduct their study on an Indian population and in an Indian environment. The outcomes of these studies are more relevant to Indian readers while the overseas readers may not get along with the findings as their population and environment are different. From this viewpoint, Indian Journals are a better option as it has the highest circulation in our own country. It has been observed that most of the management schools in our country keep journals published in India. So, the best way to enrich our research culture is by publishing good research papers in Indian journals. This is how the contribution of our faculties will be shared more by the people of our country. The overseas journals are not up to the reach of large section of people of our country. So, whatever innovative thoughts, updated knowledge are expressed in a paper not published in our Indian journals are not of much avail by our own teaching fraternity. Thus, by getting the research papers published in our Indian journals will certainly enrich our research culture.

(ii) Rich Book Bank : Creating research culture requires very rich collection of text books of latest editions. This will keep faculty abreast with the latest developments taking place in their respective subject domains and will certainly contribute in creating and sustaining a research culture in the institution.

(iii) Seminars/Conferences/Workshops – National and International : Regular conduct of national/international level seminars/conferences/workshops, training programs etc. provide extremely rich and rewarding learning opportunities to faculty through close interface with subject experts, prominent academicians, and industry personnel. Such platforms facilitate incubating new and innovative ideas and thus cultivate a research culture in the institution.

(iv) Sponsored Research : Institution can participate by submitting technical and financial bids for securing research and evaluation studies and training program assignments with substantial funding from different government and non-government agencies/international bodies/private organizations etc. in their core competency areas.

Such exposures will definitely provide cutting edge competencies to institution for undertaking and creating a research culture on the premises. Faculty and students can greatly benefit by participating in such ventures on platform of the institute and also build and augment capacities of the institution for undertaking such projects in future.

(v) Past Projects : Digitization of the good quality research projects completed by students in past under the supervision and direction of faculty be done and kept in institution library for information and future reference. Any new development mentioned in such project reports be used by faculty/students for upgrading their knowledge on the subject.

(vi) Present Projects : Institution may facilitate students by making available all possible required inputs for successful completion of projects. Good completed projects will become asset of the institution which will help in establishing the research culture. Faculty may draw benefits from such project reports which may also be used to enrich deliverables for class room teaching.

(vii) Research Students : Strong research culture of the institution may attract prospective researchers to get them registered under the guidance and supervision of the institution's faculty for their doctoral work in the subject areas of their interest. Collective competence of the faculty may be of great help to such scholars in completion of their research work. Good infrastructural and support facilities will further boost and augment such efforts. Rich library resources, standard books, referred national and international impact factor research journals and latest software will create an academic and research ambiance on campus. Healthy HR policies/practices will encourage students to lend their best and made value additions through their research contributions.

In the context of teaching and learning, the above mentioned pre-requisites for creating research culture are to be developed in institution, which will continuously help in updating the knowledge of the faculty which in turn will help to enrich deliverables for class room teaching. From student point of view, they will be benefited from the established research culture by getting updated by enriched deliverables and also by participating in research through research papers, research projects, and attending conferences, seminars etc.

In the context of teaching and learning, the above mentioned pre-requisites for creating research culture are to be developed in institution, which will continuously help in updating the knowledge of the faculty which in turn will help to enrich deliverables for class room teaching. From student point of view, they will be benefited from the established research culture by getting updated by enriched deliverables and also by participating in research through research papers, research projects, and attending conferences, seminars etc.

(3) Lecture Delivering Techniques and Preference of Faculty : Delivering lectures in classrooms is an art as well as a technique to be acquired by each and every faculty. In classrooms teaching, concepts get converted into technique and technology based on individual choice for better deliberation and understanding of the students.

A study conducted by Munmun (2013) showed that immediately after lecture, students recalled 70% of information presented in the first ten minutes and only 20% of that from the last ten minutes of the class. Therefore, resultant effect of quality of deliverables and effective teaching in class shall make students really benefited to receive and retain vital information delivered by faculty in classroom.

A questionnaire (Refer Appendix 1) was used to conduct a survey among faculty of different institutions in Delhi to understand the use of following different teaching pedagogies and gauge their impact on delivering lectures in classrooms:

(i) Interactive Lecture Demonstrations : It engages students in activities that confront their prior understanding of a core concept.

(ii) Investigative Case-Based Learning : It involves students in addressing real life problems.

(iii) Interdisciplinary Approaches to Teaching : This entails use and integration of methods and analytical frameworks from more than one academic discipline to examine a theme, issue, question or topic.

(iv) Game-Based Learning : It is written to deliver topic through a game which attracts student's attention better.

(v) Role Playing : This immerses students in debate around the issues assigned to them.

(vi) Inviting Experts from Industry/Corporates : Lectures on specific topics by experts from industry/corporate provide opportunity to students to interact with them to gather knowledge on how the theoretical concepts are applied to real life situations.

(vii) Just-in-Time Teaching : This gets students to read assigned material outside class, respond to short questions online, and then participate in discussion and collaborative exercises in the next class period.

(viii) Use of Video Clips : For better understanding of students, video-clips are used for explaining a topic.

(ix) Classroom Experiments : These are activities wherein any number of students work in groups on carefully designed and guided inquiry questions.

(x) Coached Problem Solving : It is a class format in which faculty provides a structured and guided context for students working collaboratively to solve problems.

(xi) Visit to Industry/Corporates : For better clarity and understanding, faculty takes students to industry/corporate and explain things in the light of whatever has been taught in classes.

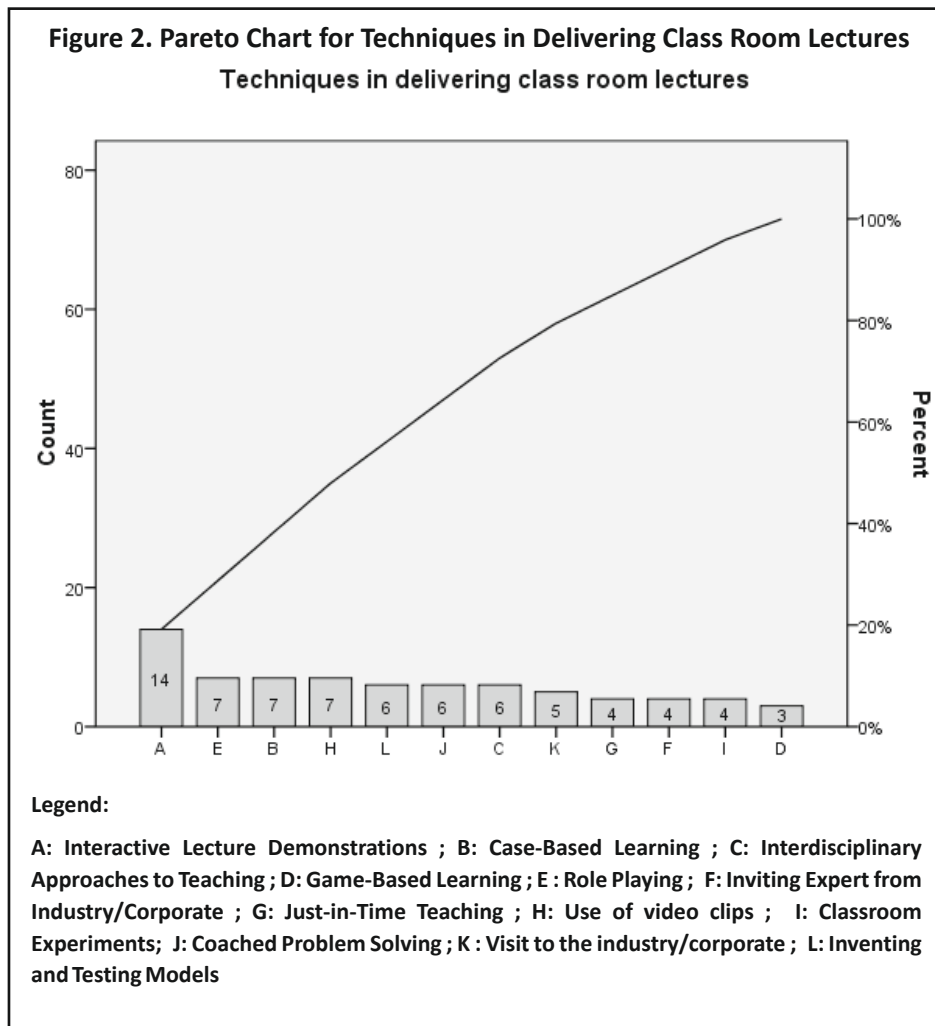
(xii) Inventing and Testing Models : This approach uses Model-Eliciting Activities, which are posed as open-ended problems designed to develop creativity in students by inviting them to build models in order to solve real-life problems with the application of subject knowledge.

Responses received from faculty were analysed by Pareto Analysis to determine the preferential sequence, which is given and Pareto-chart is shown in the Figure 2.

- ↗ Interactive lecture demonstrations,
- ↗ Investigative case-based learning,
- ↗ Interdisciplinary approaches to teaching,
- ↗ Role playing,
- ↗ Use of video clips,
- ↗ Coached problem solving,
- ↗ Inventing and testing models.

Managerial Implications

The research culture of an institution focuses on different research activities which facilitate learning process of the faculties of the institute which leads to enrich the quality of deliverables for the class room. Through this research culture, the faculties can update their knowledge of particular subject, can take note of the recent developments that took place in the outer world and pass on this information to the students in their class room teaching. Thus the research culture is the overall image of an institution to which the management, faculty and the students are attached to.



Conclusion

In this rapidly changing environment, research has become a must for both the faculty and students. The need of the hour is that faculty must keep itself updated to meet expectations of students. Unless it is done, faculty will not be able to make any value addition to the domain of knowledge. Therefore, each institution is considered as an input – output system where one of the vital inputs is 'faculty' and outputs are the 'passed out students'. So in order to get good quality output, faculty must develop and be an active partner in creating and sustaining research culture in the institution by promoting research and creating excellent deliverables so as to enhance quality of classroom teaching. The present study reveals that in academic institutions, one must take care of the following to develop the research culture:

- (i) Establish “research park” in the institute with the funding of AICTE.
- (ii) Prepare and submit “Research proposals” under Research Promotion Scheme (RPS) to AICTE for seeking research grant to pursue research work.
- (iii) Organize seminars/workshops/conferences/symposiums/training programs, FDPs in the institute.
- (iv) Conduct review of books and make it available in the library for reference.

- (v) Conduct review of research papers published in referred journals and make it available in the library for reference.
- (vi) Reward both faculties and students to publish research papers in referred journals.
- (vii) Work for research projects of UNDP/World Bank/Asian Development Bank.
- (viii) Encourage and accord financial help to faculty for participating in seminars/conferences/workshops etc. organized by within the country and outside the country.

Limitations of the Study and Scope for Further Research

The Data collection and presentation is very important in any research work as it creates the structure of the research work. In our country, it is more difficult to extract the data from the Government organizations. This readers of this research work could have got more pleasure, if the data presented would have been very recent. The limitation of this research work is that very recent data could not be procured from Government organizations and I had to depend on the website of the organisation which has not been updated by the concerned organization for the reason best known to them.

References

- All India Council for Technical Education (AICTE) (2016). *AQIS guidelines and process handbook 2015 - 16 : Research Promotion Scheme*. Retrieved from www.aicte-india.org/downloads/handbook.pdf
- All India Council for Technical Education (AICTE). (2012). *Annual report (2011-2012)*. Retrieved from http://www.aicte-india.org/downloads/Annual_report_11_12.pdf#toolbar=0
- Benek-Rivera, J., & Mathews, V. E. (2004). Active learning with jeopardy: Students ask the questions. *Journal of Management Education*, 28, 104 - 118.
- Cook, E. D., & Hazelwood, A. C. (2002). An active learning strategy for the classroom. *Journal of Accounting Education*, 20, 297 - 306.
- Guthrie, J. T., & Cox, K. (2001). Classroom conditions for motivation and engagement in reading. *Educational Psychology Review*, 13 (3), 283-302.
- Hackathorn, J., Solomon, E. D., Blankmeyer, K. L., Tennial, R. E., & Garczynskib, A. M. (2011). Learning by doing : An empirical study of active teaching techniques. *The Journal of Effective Teaching*, 11 (2), 40-54.
- Hackathorn, J., Solomon, E. D., Tennial, R. E., Garczynski, A. M., Blankmeyer, K., Gebhardt, K., & Anthony, J. N. (2010). You get out what you put in : Student engagement affects assessment. *Poster presentation : Best Practices in Assessment Conference*, Atlanta, GA.
- Hill, R. (1999). Revisiting the term "Research Culture." Paper presented in the *Proceedings of the HERDSA Annual International Conference*, Melbourne, 12-15 July, 1999.
- Kaur, I., Shri, C., & Mital, K. M. (2015). A flexible approach towards effective teaching : Use of social media by teachers. *Global Journal of Flexible System Management*, 16 (4), 391-403.
- Michel, N., Cater III, J. J., & Varela, O. (2009). Active versus passive teaching styles: An empirical study of student outcomes. *Human Resource Development Quarterly*, 20 (4), 397-418.

- Ministry of Human Resource Development, Government of India (2015). *Annual report (2014-15) : Research Park*. Retrieved from http://mhrd.gov.in/sites/upload_files/mhrd/files/document-reports/part1.pdf
- Munmun, S. B. (2013). Methods of delivery of lectures in classroom. *IOSR Journal of Research & Method in Education*, 1 (2), 52-58.
- National University of Educational Planning and Administration. (2015). *Annual Report (2014-15) : Research*. Retrieved from [http://www.nuepa.org/new/download/Publications/Annual%20report%202014-15\(ENGLISH\)-web.pdf](http://www.nuepa.org/new/download/Publications/Annual%20report%202014-15(ENGLISH)-web.pdf).
- NCERT. (n.d.). *Division of educational research*. Retrieved from <http://www.ncert.nic.in/departments/nie/der>
- Peck, A. C., Ali, R. S., Matchock, R. L., & Levine, M. E. (2006). Introductory psychology topics and student performance: Where's the challenge? *Teaching of Psychology*, 33 (3), 167-170.
- Planning Commission, Government of India. (2014). *Annual Report 2013-2014 : Research Division*. Retrieved from http://www.planningcommission.gov.in/reports/genrep/anu_e13_14.pdf
- Reber, P. (2010). What is the memory capacity of the human brain? *Scientific American*. Retrieved from <http://www.scientificamerican.com/article.cfm>
- Sarason, Y., & Banbury, C. (2004). Active learning facilitated by using a game-show format or who doesn't want to be a millionaire? *Journal of Management Education*, 28, 509 - 519.
- Stewart-Wingfield, S., & Black, G. S. (2005). Active versus passive course designs: The impact on student outcomes. *Journal of Education for Business*, 81, 119 - 125.
- Talib, F., Rahman, Z., & Qureshi, M. N. (2010). Pareto analysis of total quality management factors critical to success for service industries. *International Journal of Quality Research*, 4 (2), 155-168.
- Tata. (n.d.). *Sir Dorabji Tata Trust : Institutional grants*. Retrieved from <http://www.tata.com/aboutus/articlesinside/Sir-Dorabji-Tata-Trust-and-the-Allied-Trust>
- University Grant Commission (UGC). (2015). *Annual Report (2014-2015) : Promotion of research*. Retrieved from http://www.ugc.ac.in/pdfnews/2465555_Annual-Report-2014-15.pdf
- Whetten, D. A., & Clark, S. C. (1996). An integrated model for teaching management skills. *Journal of Management Education*, 20, 152 - 181.
- Xinying, S., Xue, Z., & Zhang, H. (2015). A study on the research oriented teaching courses : Reform in Chinese colleges and universities. *International Journal of Information and Education Technology*, 5 (4), 260-264.

Appendix - I

The objective of this questionnaire is to collect information about the preference of faculties on different techniques for delivering classroom lectures in the context of effective teaching.

1. Gender: Male (☐) Female (☐)
2. Age: 25 to 35 (☐) 36 to 50 (☐) 51 and above (☐)
3. Educational Level:
Postgraduate (☐) Postgraduate with UGC-NET (☐) Doctorate (☐)
4. Academic/Teaching Experience:

The following statements relate to your preference and use of various techniques in delivering lectures in classroom. Please Tick Mark [☒] against those techniques which you use and prefer. Please leave those options blank which neither you use nor you prefer.

1. Interactive Lecture Demonstrations: It engages students in activities that confront their prior understanding of a core concept. [☐]
2. Investigative Case-Based Learning: It involves students in addressing real life problems. [☐]
3. Interdisciplinary Approaches to Teaching: This entails the use and integration of methods and analytical frameworks from more than one academic discipline to examine a theme, issue, question or topic. [☐]
4. Game-Based Learning: It is written to deliver the topic through a game which attracts student's attention better. [☐]
5. Role Playing: This immerses students in debate around the issues assigned to them. [☐]
6. Inviting Expert from Industry/Corporate: Arranging lecture on specific topic by the expert from industry/corporate which provides the opportunity to the students to interact with the expert to gather the knowledge on how theory is applied into practice in real life situation. [☐]
7. Just-in-Time Teaching: This gets students to read assigned material outside of class, respond to short questions online, and then participate in discussion and collaborative exercises in the following class period. [☐]
8. Use of video clips: For the better understanding of the students, the explanation of the topic with the help of video-clips. [☐]
9. Classroom Experiments: They are activities where any numbers of student work in groups on carefully designed guided inquiry questions. [☐]
10. Coached Problem Solving: It is a class format in which professors provide a structured, guided context for students working collaboratively to solve problems. [☐]
11. Visit to the industry/corporate: The teacher takes the students to industry/corporate and explain the things in the light of whatever taught in the class for better clarity. [☐]
12. Inventing and Testing Models: This approach uses Model-Eliciting Activities, which are posed as open-ended problems that are designed to develop creativity within the students inviting them to build models in order to solve real-life problems with the application of subject knowledge. [☐]