Institute of Chemical Technology, Mumbai

Deemed to be University under Section 3 of UGC Act 1956

Elite Status and Centre of Excellence, Govt. of Maharashtra

NAAC A++ CGPA 3.77/4.00

NIRF Ranking 2020:

Pharmacy - 4, Engineering - 18,

University: 18, Overall: 34

With campuses at

MARATHWADA JALNA

MUMBAI

IOC BHUBANESWAR

Category I Institute (MHRD/UGC)

State Funded Public Institute

QS World University Rankings:

Asia – 152, India – 22

Times higher education ranking:

Asia- 92, India - 7

Prof. A. B. Pandit
Vice Chancellor

Prof. S. S. Bhagwat
Dean, IQAC

Prof. P. V. Devarajan
Coordinator, TEQIP-III &
former president, UAA

Prof. V. G. Gaikar
Bharat Petroleum
Distinguished Professor and
former VC, Dr. BATU

ICT Mumbai: A Multi-Campus Category I University

Addition of Two More Off-campuses 2018-19

- ICT Mumbai Indian Oil Odisha Campus Bhubaneswar: 18th March 2018 (~Rs. 500 Cr under CSR)

- ICT Mumbai Marathwada Campus, Jalna: 4th May 2018 (Rs. 297 Cr + Rs 100 Cr through philanthropy + CSR)

Programs

Mumbai

- 9 UG
- 18 PG
- 29 Ph D
- 1 PGDCTM
- 1 CCCSRM

Bhubaneswar

- i-M. Tech. (Major Chem. E)
- 7 Minor Chem Tech
- M. Tech. (trimester)
- e-M. Tech.
- Ph. D.
- (all S & E)

Jalna

- i-M. Tech.
- (Major Chem E)
- 7 Minor Chem Tech
- M. Tech. (trimester)
- Ph D.
- (all S & E)

Padma Awardees

ICT Alumni contributing to ~ 8 % India's GDP

Shri Mukesh Ambani,

CMD, Reliance Industries

Shri Aswhin Dani

VC, Asian Paints

Dr K Anji Reddy

Dr Reddy's Lab

Some Noted Alumni as Members of Board

Shri Nikhil Meswani

Reliance Industries

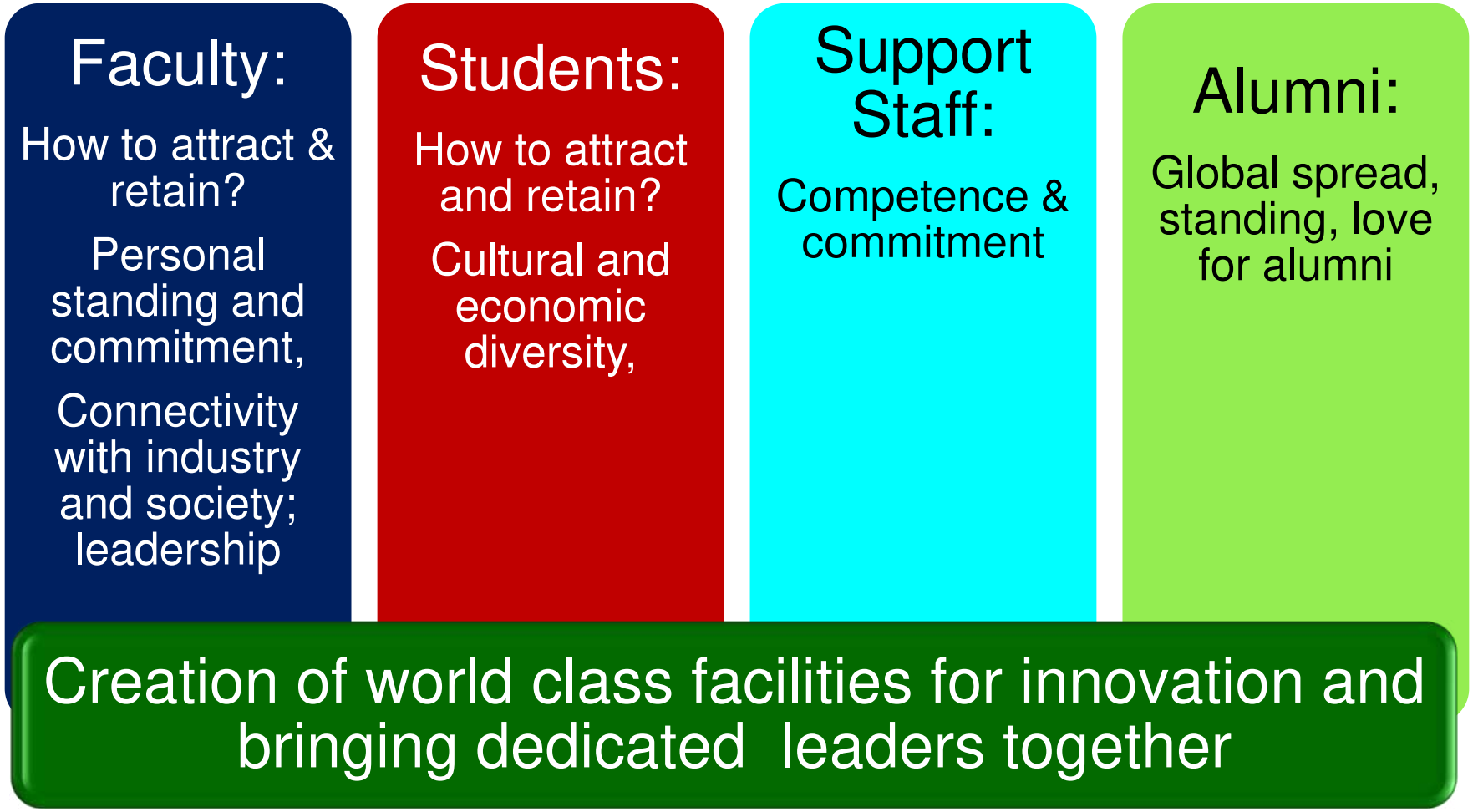
Shri Madhukar Parekh

CMD, Pidlite Industries

Shri Narotam Sekhsaria

Ambuja Cement

Nurturing Excellence – The Four Pillars Working in Tandem



Success Mantra

- Dedicated and accomplished faculty; Freedom to appoint
- Talented students coming from all strata without any donation
- Spirit of entrepreneurship- Alumni, Faculty and Current Students
- Over 500 first generation entrepreneurs
- Spirit of innovation among faculty, students & alumni
- Best example of trinity of academia-industry-government relationship
- Industrial consultations by faculty -Practice what you preach

Concentration on Sectoral Excellence

- ✓ Faculty
- ✓ Industrial growth in chemicals and allied sectors.
- ✓ Entrepreneurship.
- ✓ Tall leadership over the years. Coming from abroad and all over India.
- ✓ Assisting students on merit-cum means and socially disadvantaged groups.
- ✓ Faculty member as centre of excellence
- ✓ Industrial consultation with 1/3 share of institute.

ICT : Culture, Creativity and Connectivity

- ✓ No. 1 in India, 4 globally in publications in Ch E: Prof Jude Sommerfeld, Georgia Tech USA
- ✓ 9 UG, 18 PG, 29 Ph D programs, 1 PGDCTM, 1CCCSRM
- ✓ 636 Ph D Students (2018-19)
- ✓ 533 Masters (2018-19)
- ✓ 1100 UG students (main), 135 (Bhubaneswar), 130 (Jalna)
- ✓ 360 UG Scholarship
- ✓ 140 Ph.Ds during 7th Convocation on 23rd Feb. 2018
- ✓ 100+ UG Summer Researcher Fellows
- ✓ Highest citation per faculty
- ✓ Annual citations per year more than 10,000
- ✓ SCOPUS Awards: 4 faculty in top 10 Chem. Engg. and 2 in top Chemistry faculty in India: 20th March 2018

ICT : Culture, Creativity and Connectivity

- ✓ 4 Fellows of INSA, NASI, IASc, INAE, 4 Fellows of TWAS, 4 JC Bose Fellows
- ✓ 23 Endowment Chairs; 15 UGCFR, 8 INSPIRE, 2 Ramanujam, 2 Ramalingaswami fellows
- ✓ 49 Endowment Visiting Fellowships; 11 endowments for library
- ✓ India's five Ph Ds in E & T from ICT in 1941-42
- ✓ 468 papers: 2018; 413 Patents filed in last 10 years
- ✓ 104 Projects including multinational; Publications/faculty highest
- ✓ > 500 first generation entrepreneurs
- ✓ 2 Ch E alumni FRS, London
- ✓ Donations under CSR, 80G, 35(I) (II) 3 C, 3E
- ✓ Many technologies transferred to industry.

MOU signed (total 136)

Government, Labs, Academic Institutes: **23**

Industries & Industrialists: **94**

International: **19**

New Initiatives

- ✓ Cloud based MIS system
- ✓ Biometric attendance system
- ✓ Video conferencing facility
- ✓ Lecture recording facility
- ✓ Roof-top solar system
- ✓ Garden and Food waste management system
- ✓ RFID based identity cards

Facilities for Students

Medical Facility

- ✓ MoU with Lokmanya Tilak Hospital (Sion hospital) (within a distance of 2 km)
- ✓ Everyday doctor visits the hostel for one hour (5 pm to 6 pm) from Monday to Saturday.
- ✓ Student counseling centre

Day Care Facility

- ✓ Facility is used by faculty members, support staff and Ph.D. students for their children
- ✓ Timing: 8 am to 7 pm

Sports & Recreational Facility

- ✓ Dr. B.P. Godrej Students Centre hosts Canteen, Ladies Room and recreation room for student
- ✓ Well Maintained Gym available for students in ICT Hostel 5

Community/social benefit

- Water treatment technology for lakes, and ponds (e.g. Rankala waters, Red water in Mumbai)
- Development of Mosquito Repellent Textiles
- Affordable Drug Delivery systems
- Waste-to-Assets Technologies (Waste Plastics, Industrial waste, Biomass)
- Solar cooker and Eco-cooker, Improved cooking methodologies
- Health foods and Nutraceutical formulations
- Education at affordable cost- 306 Merit-cum-means scholarships provided at UG levels
- Faculty as advisors to several Government organizations and industrial organizations for Corporate Social Responsibility

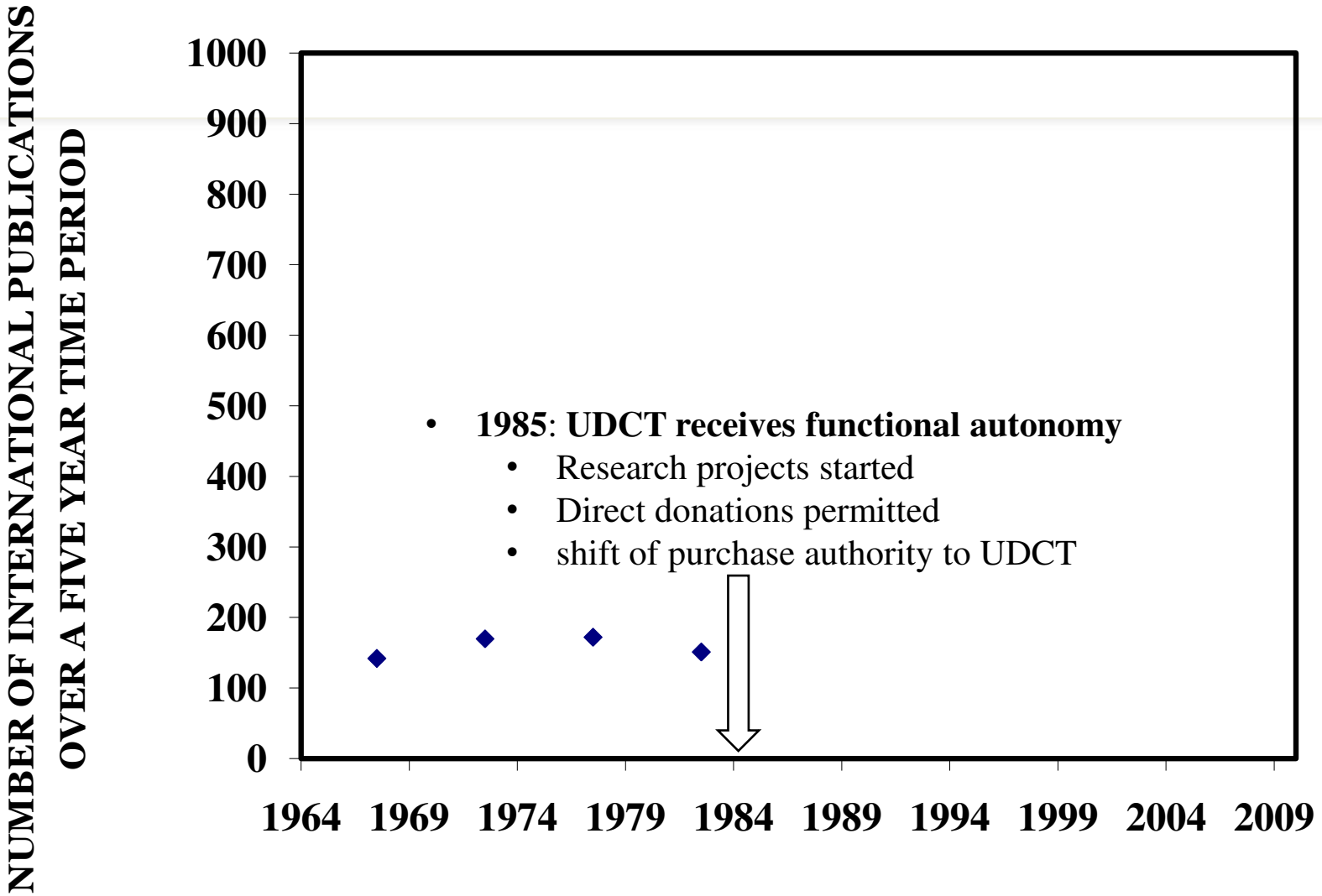
Best Practice: Autonomy - a key driver to achieve excellence

Prof. Aniruddha B. Pandit

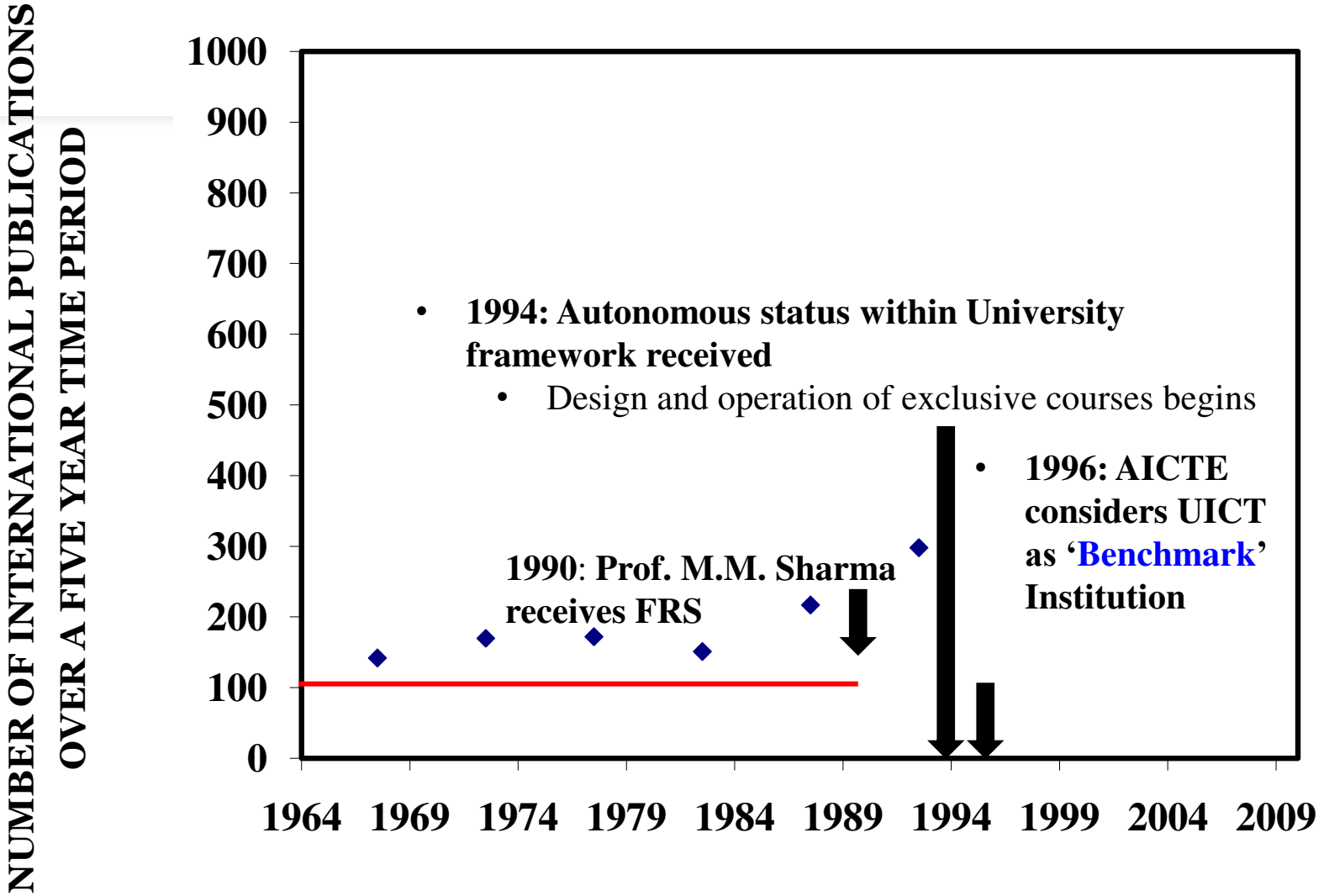
Autonomy: a key driver to achieve excellence

- Academic and financial freedom
- The time span between innovative idea generation and implementation significantly reduces
- Helps in human resource development
- All stakeholders participate actively for overall growth

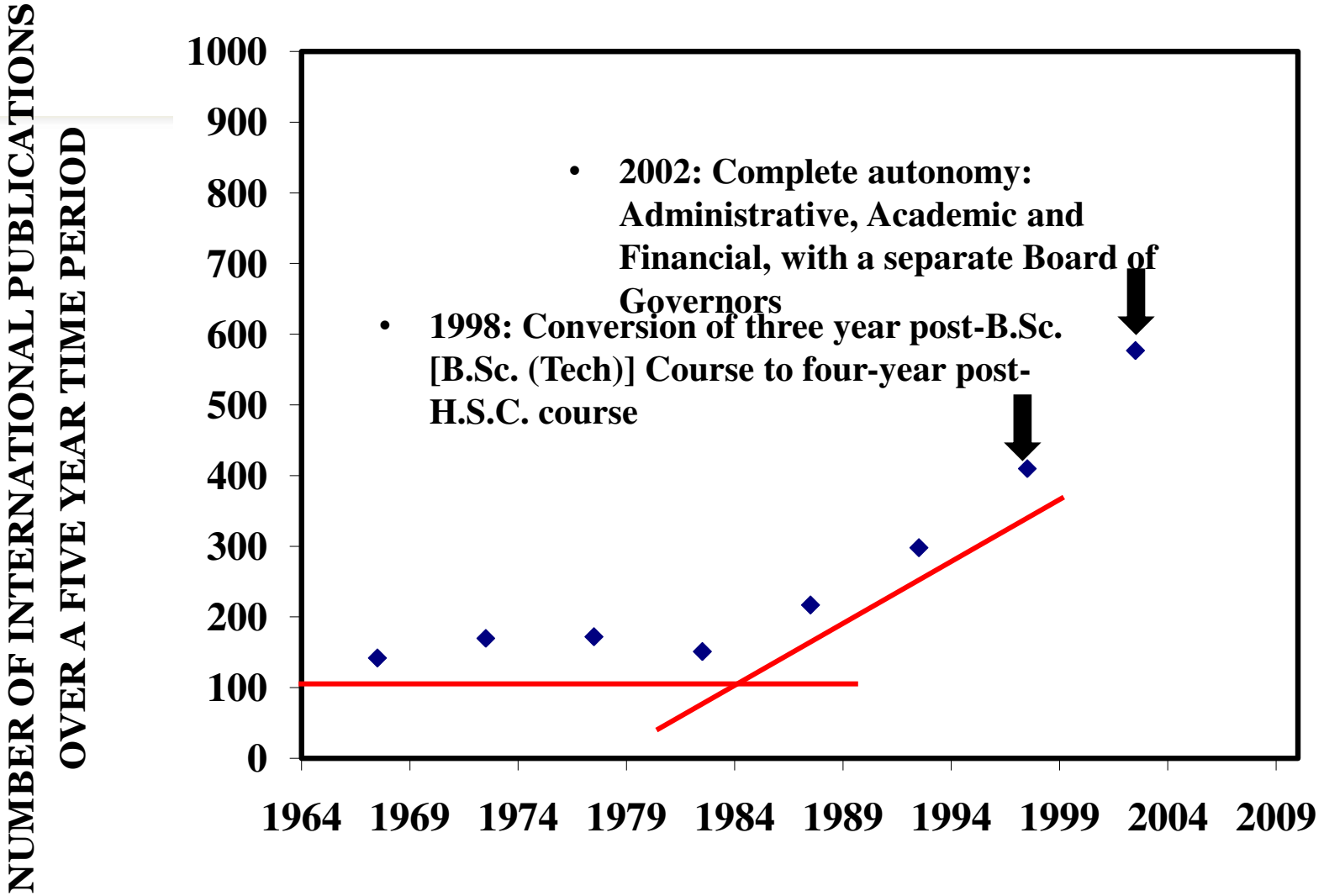
Trend in publications – a performance indicator



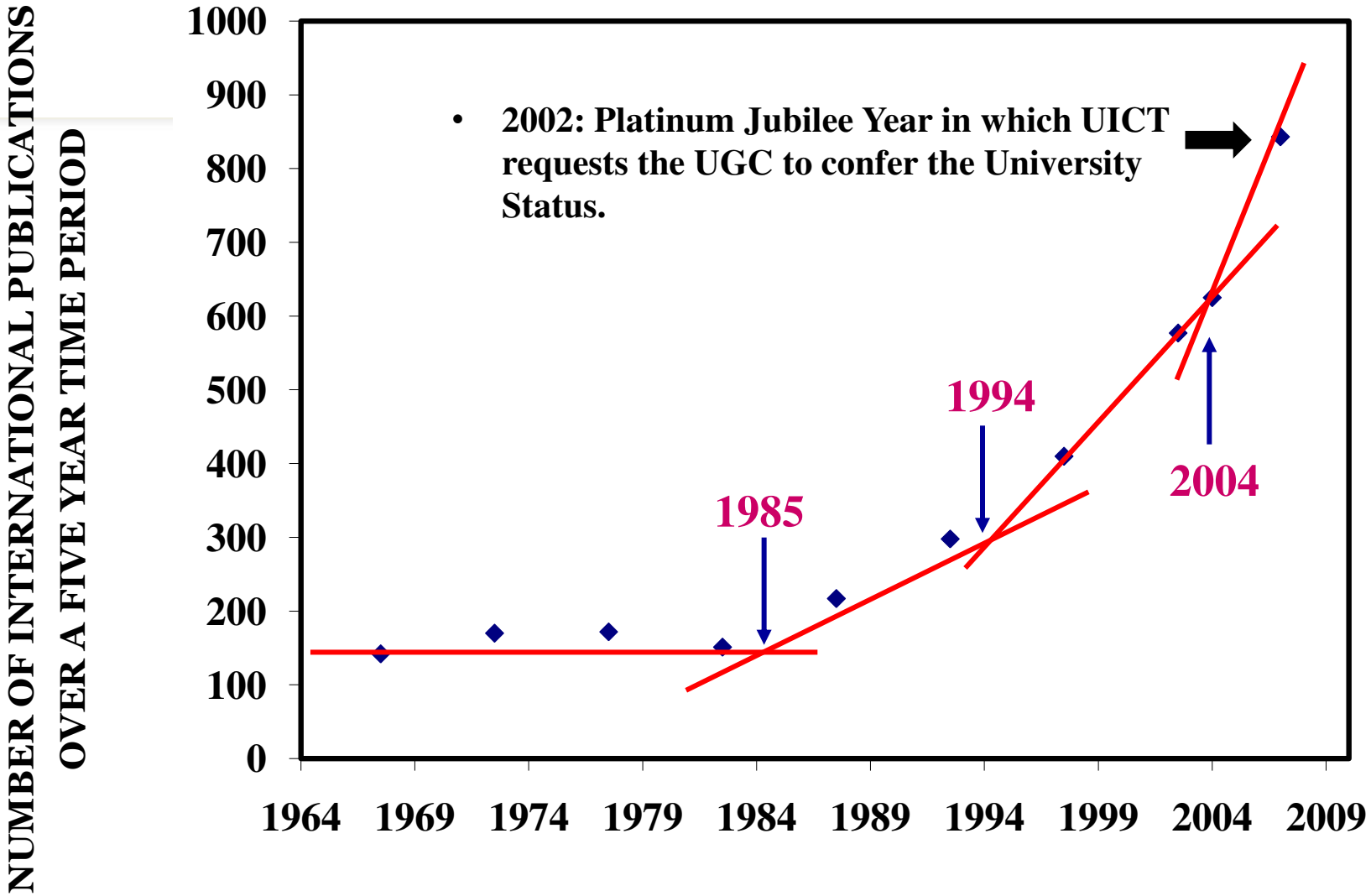
Trend in publications – a performance indicator



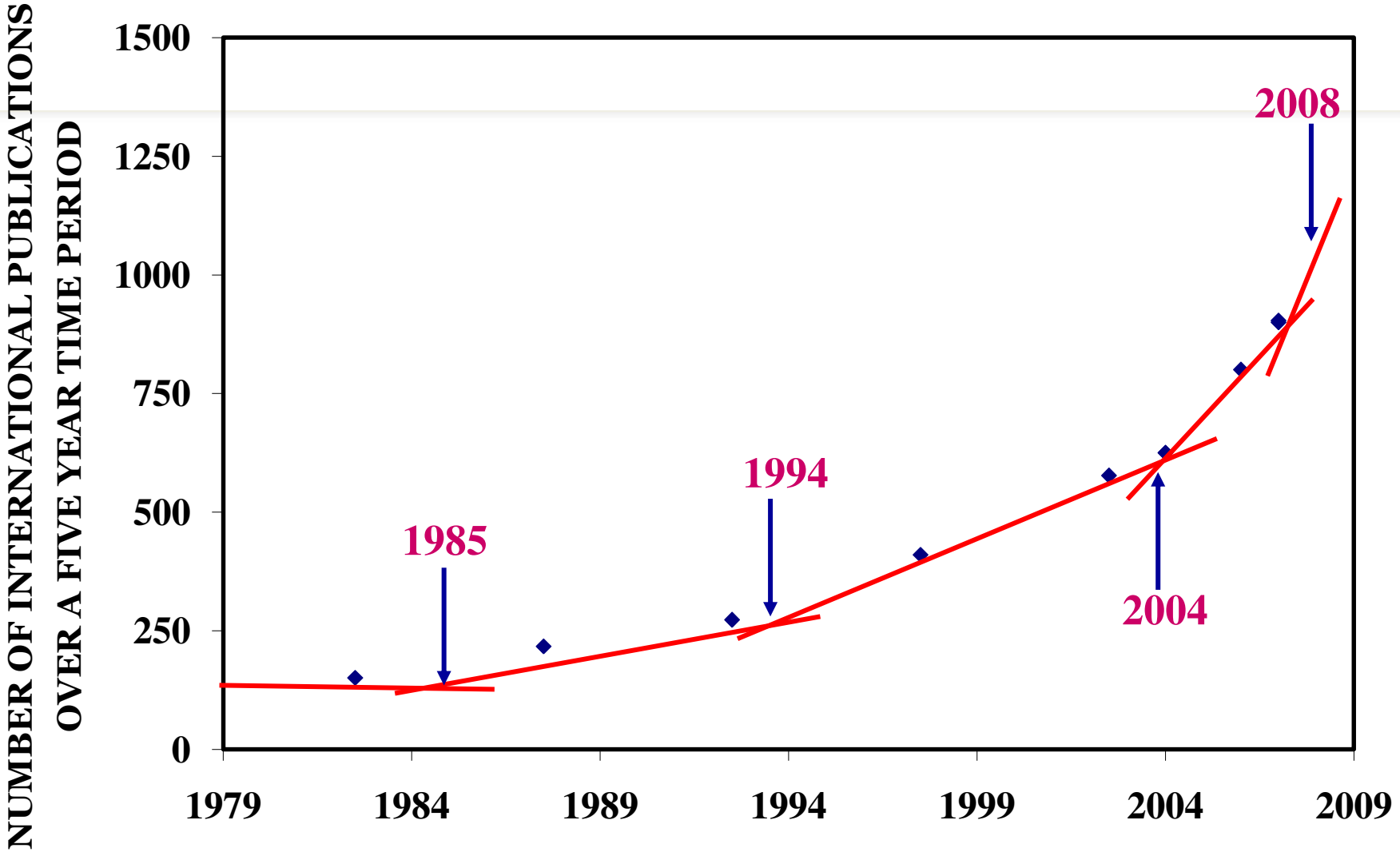
Trend in publications – a performance indicator



Trend in publications – a performance indicator

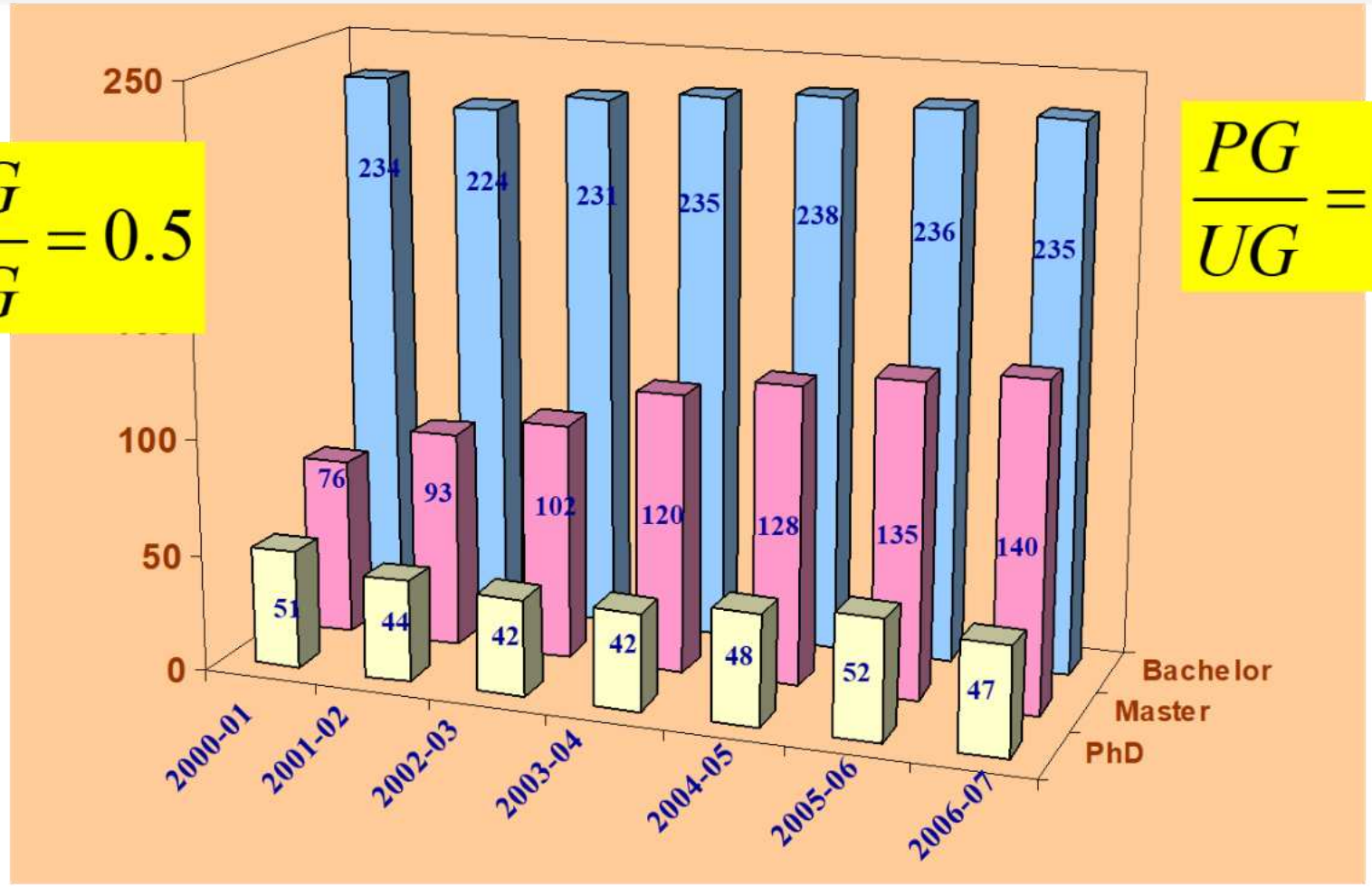


Trend in publications – a performance indicator



Degrees awarded (2000-2007)

$$\frac{PG}{UG} = 0.5$$



$$\frac{PG}{UG} = 0.8$$

Global Comparison of Chemical Engineering Departments

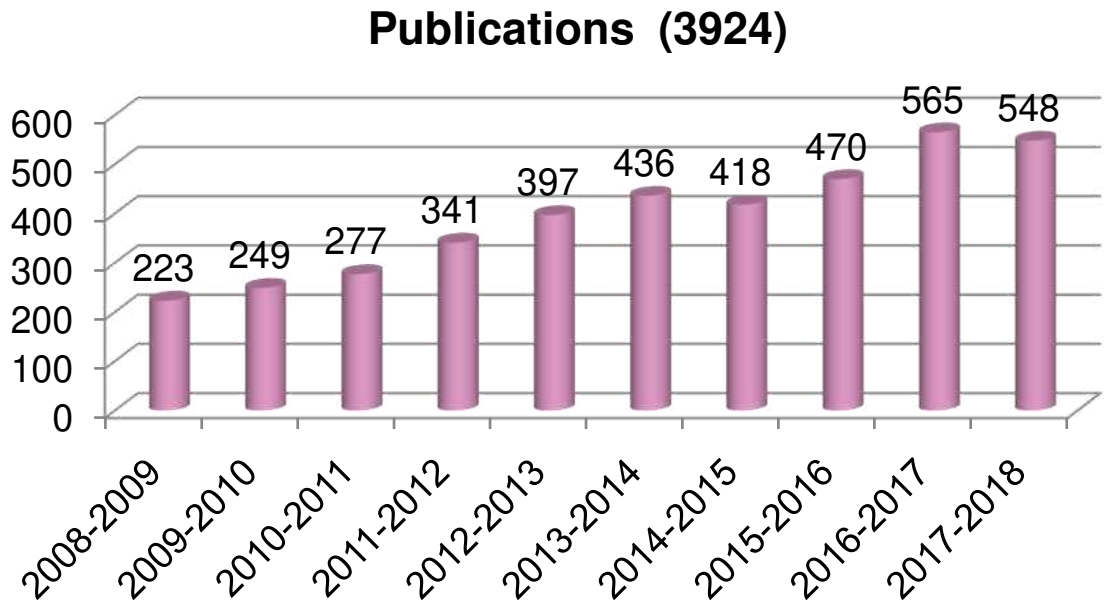
University	No. of Faculty	Expenditure in thousands US $ per faculty per year (2006)	Ongoing Graduate Students (Masters + Ph.D.s)		Papers		
			Total No.	Per Faculty	Total No. (2000-2005)	Per faculty per year	Papers per thousand US $ per year per faculty
MIT	35	657	315	9.0	1186	33.9	1.8
Minnesota	36	556	206	5.7	1089	32.0	2.0
Stanford	13	308	80	6.1	575	44.3	1.9
Caltech	19	622	109	11.0	652	34.3	1.1
Wisconsin	20	238	106	5.3	610	30.5	2.6
Berkeley	21	238	266	12.7	707	33.7	3.0
Michigan	15	267	56	3.7	615	41.0	2.3
Georgia Tech	52	308	181	3.5	674	33.9	2.2
UICT	**12**	**32**	**156**	**13.0**	**441**	**36.8**	**12.7**

Indian Scenario

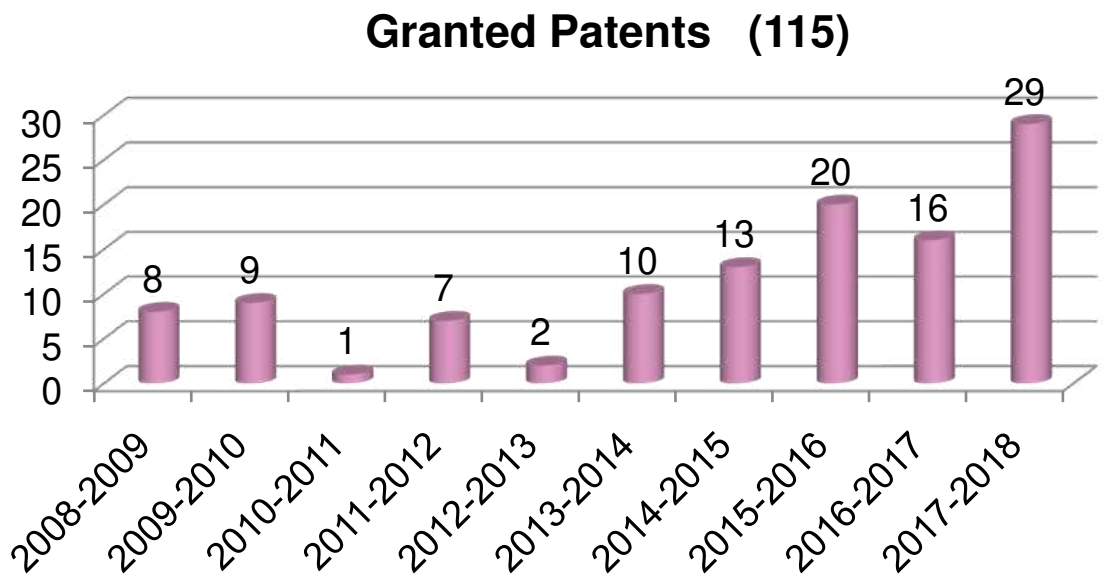
Schools	1965-1969		1970-1974		1975-1979		1980-1984	
	Pubs	Rank	Pubs	Rank	Pubs	Rank	Pubs	Rank
UICT	142	1	170	1	172	1	151	1
Kanpur (IIT)	9	7	38	3	92	2	113	2
Mumbai (IIT)	23	42	22	6	35	5	46	4
Madras (IIT)	10	6	31	5	45	4	23	9
Bangalore (IISc)	123	2	65	2	59	3	37	5
Kharagpur (IIT)	14	5	19	7	13	8	21	10
Delhi (IIT)	1	15	10	10	13	8	57	3
Subtotal	322		355		429		448	
Total of 20 others	77		102		167		162	
Total of 27 schools	399		457		596		610	

Schools	1985-1989		1990-1994		1995-1999		2000-2004		2003-2007	
	Pubs	Rank	Pubs	Rank	Pubs	Rank	Pubs	Rank	Pubs	Rank
UICT	217	1	273	1	312	1	577	1	612	1
Kanpur (IIT)	123	2	134	2	133	2	162	3	275	2
Mumbai (IIT)	67	3	93	3	104	3	160	4	246	3
Madras (IIT)	19	9	44	5	60	4	121	6	197	6
Bangalore (IISc)	39	6	46	4	58	5	173	2	184	4
Kharagpur (IIT)	17	11	24	7	38	6	88	8	181	7
Delhi (IIT)	43	4	25	6	35	7	65	9	180	8
Subtotal	525		639		740		1346		1875	
Total of 20 others	186		138		191		650			
Total of 27 schools	711		777		931		1996			

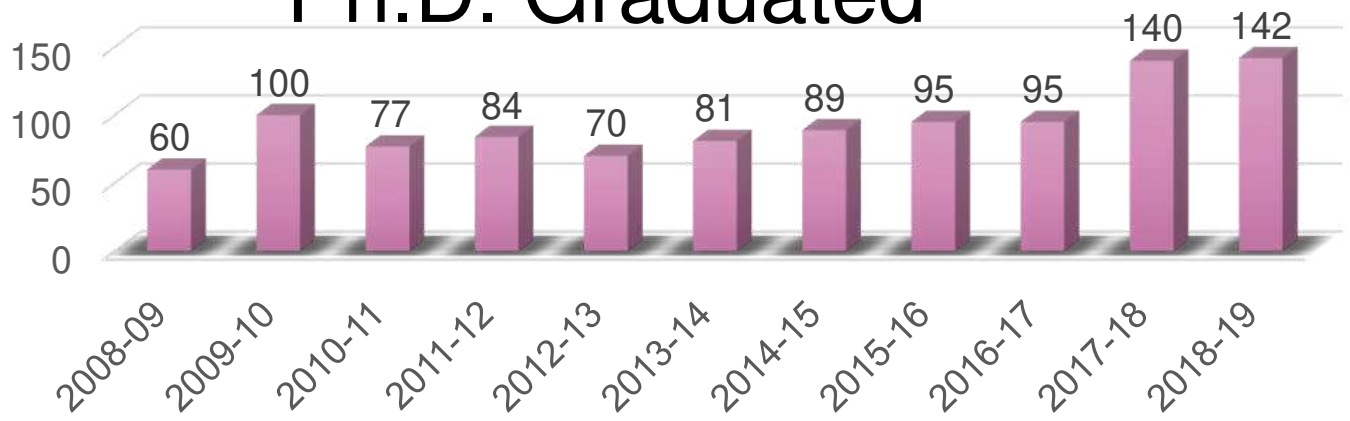
Peer Reviewed Publications



Granted Patents

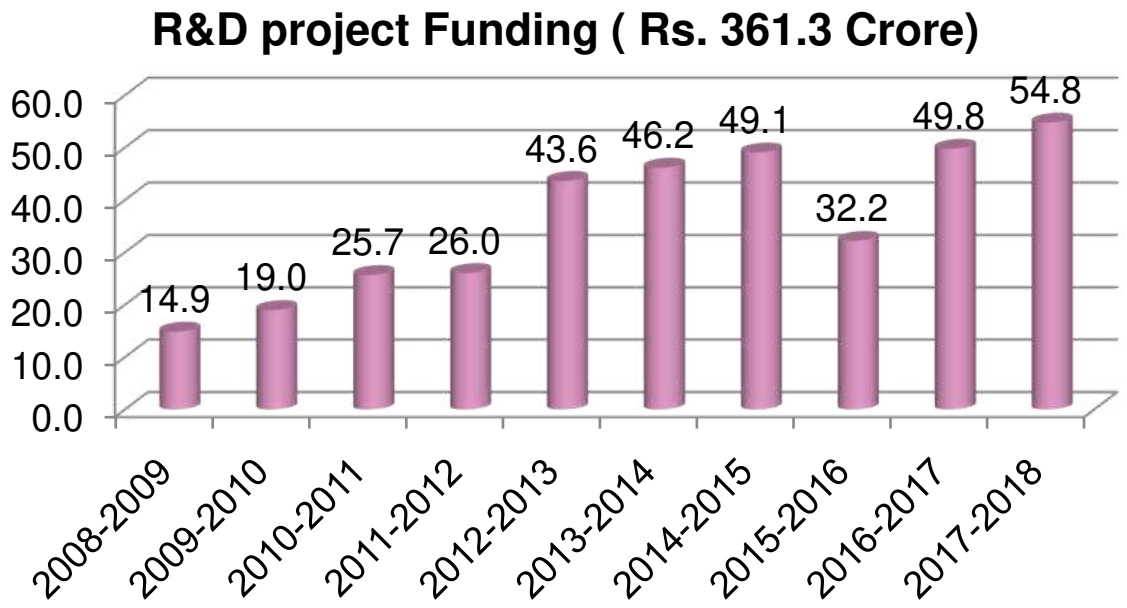


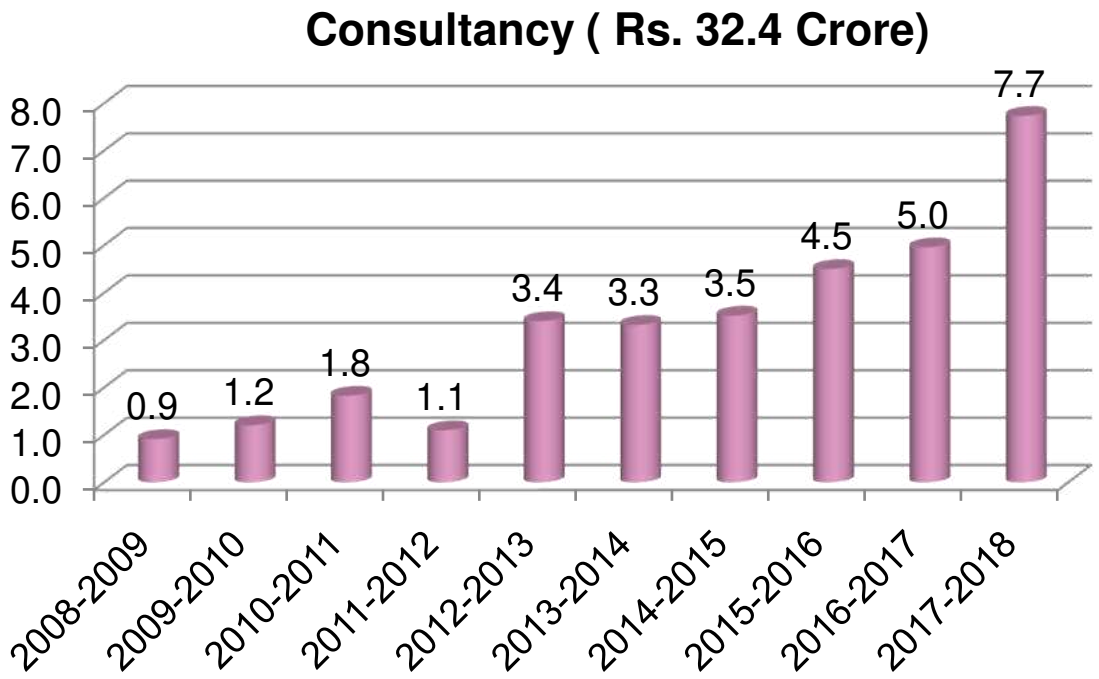
Ph.D. Graduated



R&D project funding

Industrial Consultancy





Infrastructure building through research partnership and alumni support

Research Building: Rs 215 Cr
76 Labs, 76 Faculty Cabins
6 Class rooms, 3 Mini Auditoria
1 Auditorium

Marathwada Jalna:
Sirsewadi Proposed Plan

Opportunities & Challenges

- **Opportunities**
  - Freedom to create new courses
  - Make the syllabus Dynamic in line with the national need
  - Attract the best talent and offer flexibility of operation
- **Challenges**
  - Generate Resources to implement with CSR and Alumni Involvement
  - Create an atmosphere for all the stake holders feeling a part of the team and a common cause
  - Freedom to allocate the resources as and where needed i.e. Faculty, Infrastructure, Research etc.

Best Practice: Teaching-Learning process and curriculum development

Professor S. S. Bhagwat

Content

- Need for Curriculum Revision
- Revision Process
- Highlights of Revised Curriculum
- Examination Audit
- Outcome Based Education
- Other unresolved issues

Need for Revision

- Focus on fundamental understanding
- Recent trends: keep in line with Industry Needs
- Changing mindset and learning habits of students

- B. Chem. Engg. Periodic Revision Process
  - 1984: University of Mumbai
  - 1999: Autonomous Status
  - 2009: Deemed to be University
  - 2015

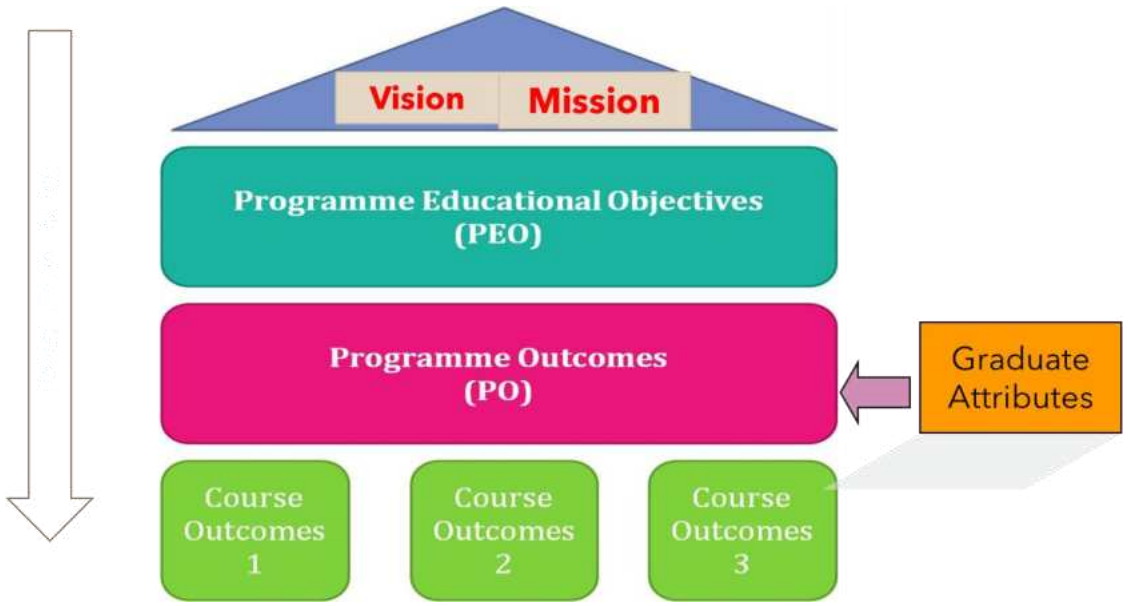
Revision Process Drivers

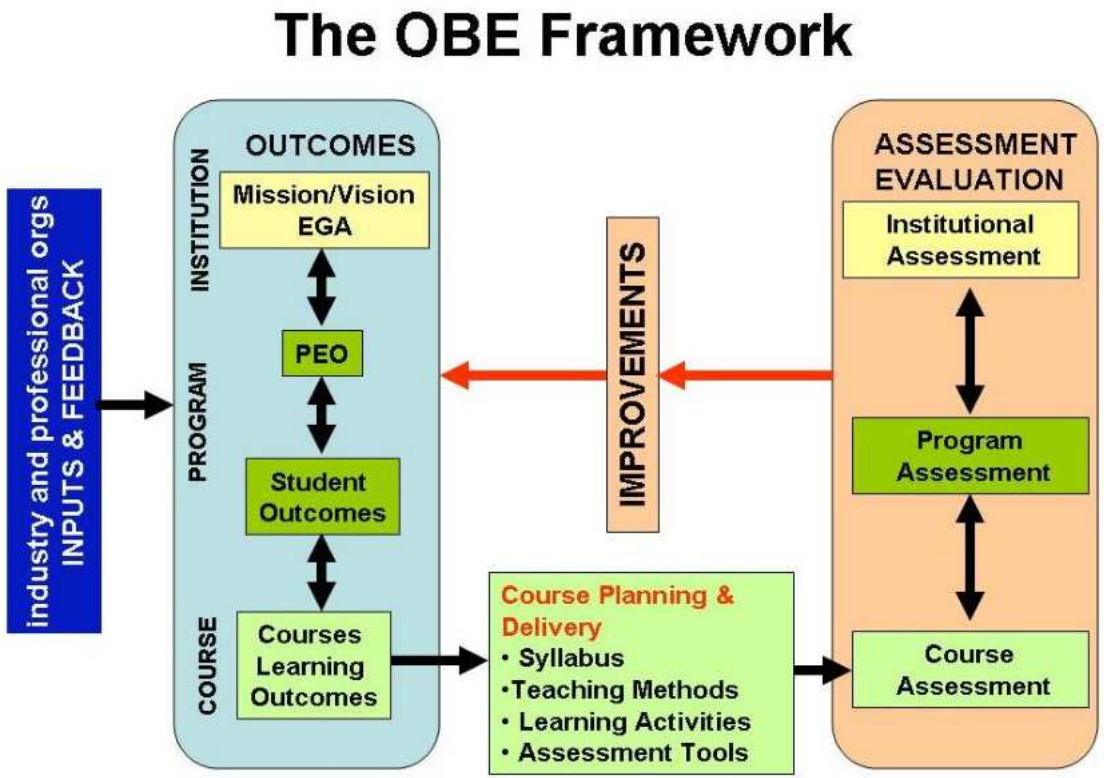
- Change of Qualifying examination, MH-CET to AIEEE, ….
- Change of syllabi of state and central boards
- Need to remove duplication especially in Chemistry, Physics and Maths at the first year level
- Starting the core Chem. Engg. courses in earlier Semesters
  - MEBC: Sem V (pre 1999), shifted to Semester III, now Semester II
- Reordering for better continuity
  - CE Thermo simultaneous / Prior to Separations

Revision Process Drivers

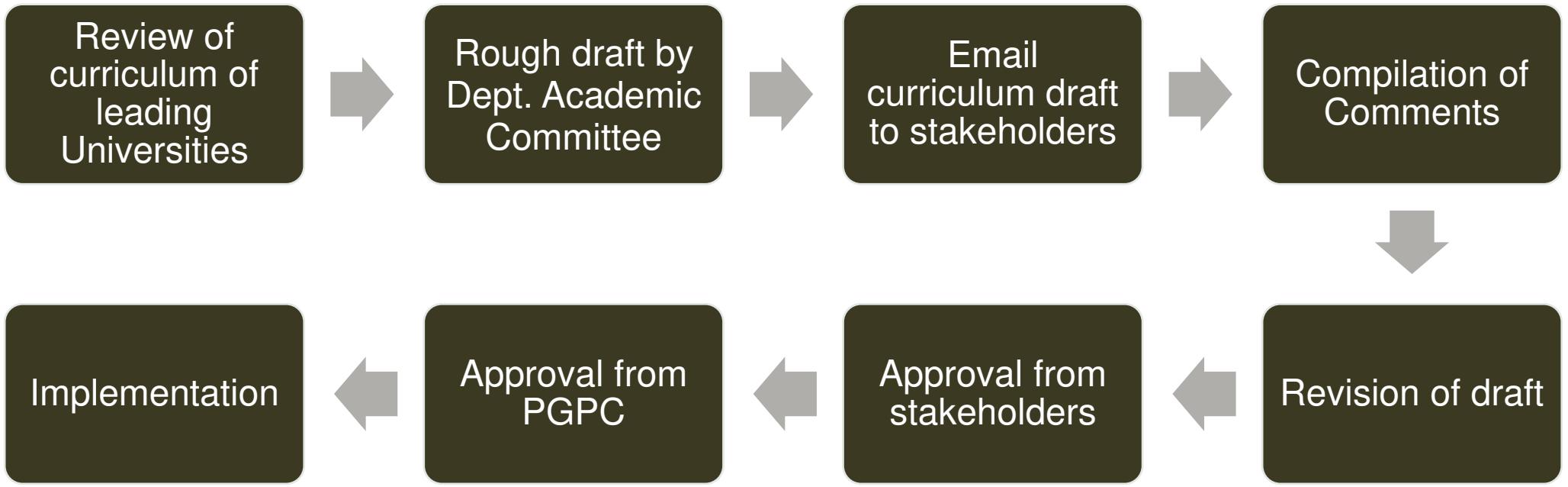
- AICTE / NBA accreditation guidelines required syllabus to be benchmarked with respect to other Institutions
- Outcome Based Education needed to be brought in
  - Program Educational objectives and Program outcomes
  - Course Outcomes
  - CO – PO – PEO Map
- Where to our students go?
  - Higher studies 40 – 50%
  - Jobs in Industry 40 – 50%
  - Management, Civil Services: 5 – 10%

Outcome based Education





Curriculum revision process



International Benchmarking

- Massachusetts Institute of Technology (MIT), USA
- University of California at Berkeley (UCB), USA
- University of California at Santa Barbara (UCSB), USA
- University of Minnesota (Twin City), USA
- University of Wisconsin Madison (UWM), USA
- Princeton University, USA

Analysis of Curriculum Component

Subject	% of the total credits in different Universities
Physics	2.0 – 7.5
Chemistry	2.8 – 15.9
Mathematics	8.1 – 17.4
Biology	1.5 – 4.5
Communication skills	1.5 – 3.8
Humanities & Management	2.1 – 12.6
General engineering	1.5 – 10.8
Core Chemical engineering	36.1 – 57.6
Electives	4.6 – 16.5

% Weightage to	Prior to 2009	Post 2009	2015 Revision
P, C, B	23	22	19
Maths	10	11	6
Gen. Engg.	17	17	15
Chem. Engg.	43	44	50
Humanities	7	6	10

Program Curriculum (stakeholders)

(a) Alumni

(b) External examiners

(c) Visiting faculty

(d) Subject experts from IIT, NCL, and other eminent institutes

(e) Industry experts

(f) Graduated students

(g) Subject experts from foreign universities. Based on their suggestions, final draft is prepared and proposed to UGPC and academic council for final implementation.

Feedback

- Students have excellent background in chemistry, industrial aptitude, core chemical engineering subjects.
- Analytical abilities and mathematical aptitude needs to be further strengthened
- Students need to be exposed to newer and emerging areas in Chemical Engineering and Technology, such as, nanotechnology, biotechnology, product design, sustainability, energy engineering, etc.

Feedback

- Industry relevant applications, such as, Chemical process Safety, Scale-up, Engineering standards and codes, P&ID, etc. need to be covered
- Students need to be exposed to standard commonly used softwares, such as, MATLAB, ASPEN, etc.
- Syllabus needs to have more electives and flexibility for student to choose courses as per liking, electives can be grouped to form one area of expertise
- Interpersonal skills, team work need to be strengthened
- Knowledge in management related subjects need to be enhanced; e.g. finance, human resource, IP, etc.

Major Changes Made

- Reduced Repeated portion of Chemistry and Physics
- Eliminated overlap between PC and CE Thermodynamics
- Re-orientation of Maths courses to ‘Mathematical Methods in Chemical Engineering’, ‘Optimization of Chemical Processes’
- Increased ‘Humanities’ credits
- Process Simulation Lab introduced
- Industrial internship after semester VI increased from 6 – 8 weeks to 10 – 12 weeks
- Chemical Engineering lab brought in earlier
- Home paper / Design project spread over semester VII and VIII
- Electives opened across the Institute

Subjects Added

- Analytical Chemistry
- Physics
- Biochemical Engineering
- Use of AutoCAD
- Modeling and Simulation Laboratory
- Engineering aspects of vacuum systems, refrigeration, pumps and compressors
- Optimization methods

Regulatory Requirements

- CO – PO mapping
- PO – PEO mapping: by feedback from past students < 10 year period
- Feedback from Graduating Students
- Feedback from Parents

Examination Audit: Need & Committee

Need:

a) Continuous improvement
b) Examination should be learning oriented
c) Examination should evaluate how the student can apply the knowledge in real life situation

Committee Constitution:

a) HOD as Chairperson
b) One Professor from other institute as a member
c) One of the senior faculty member from other departments in ICT as a member
d) One faculty from the Department as a member

Examination Audit: Steps

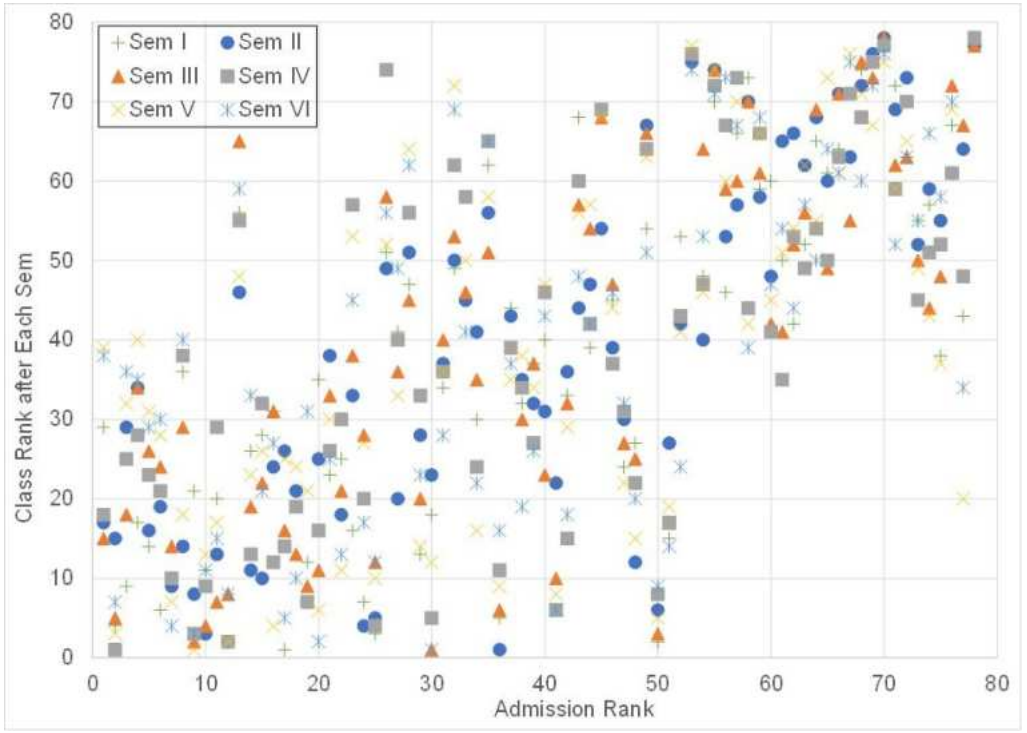
- **Step 1.** Collecting question papers of all the examinations that includes continuous assessment mid-sem and end sem.
- **Step 2.** A set of questionnaires for each subject were sent to all the students in case of masters and a sample of students (5-7 in each branch) in case of UG.
- **Step 3.** The data obtained from step 2, were compiled for each subject for all students and average scores were calculated.
- **Step 4.** The audit committee met to go through each and every question papers and final scores along with comments were allotted by the committee after due discussions. Needless to say that scores given by the students were given due importance. Following is the report format.
- **Step 5.** The audit report of were shared with individual faculty.
- **Step 6.** The examination audit report were also discussed in the department faculty council meeting and corrective measures if required were suggested to the faculty.
- **Step 7.** The examination audit report were sent to the Institute IQAC cell.

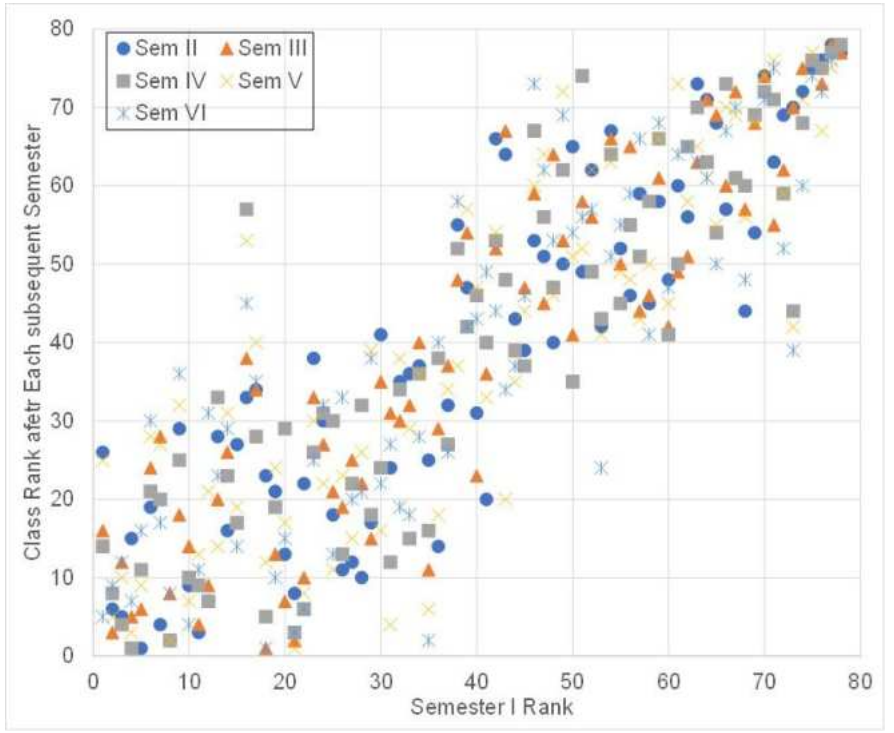
Examination Audit: Questionnaire

Sr. No.	Questions	Rating (1-10)
1	Whether Mid Sem question paper covers 50% & End Sem question paper covers the entire syllabus?	
2	Whether the question paper can be solved in the given time?	
3	Whether internal options were given?	
4	Whether question paper was grammatically correct?	
5	Whether the questions were unambiguously worded?	
6	Any novel questions which made you think?	
7	Whether question paper had short note type questions?	
8	Whether number of class tests for internal assessments were sufficient and evenly spaced?	
9	Whether the evaluation was fair and transparent?	
10	Whether evaluated answer sheets were returned in time?	
11	Are the mode of assessment for continuous assessment proper and announced in the beginning of the semester?	
12	Overall quality of questions.	
13.	Any other comments.	

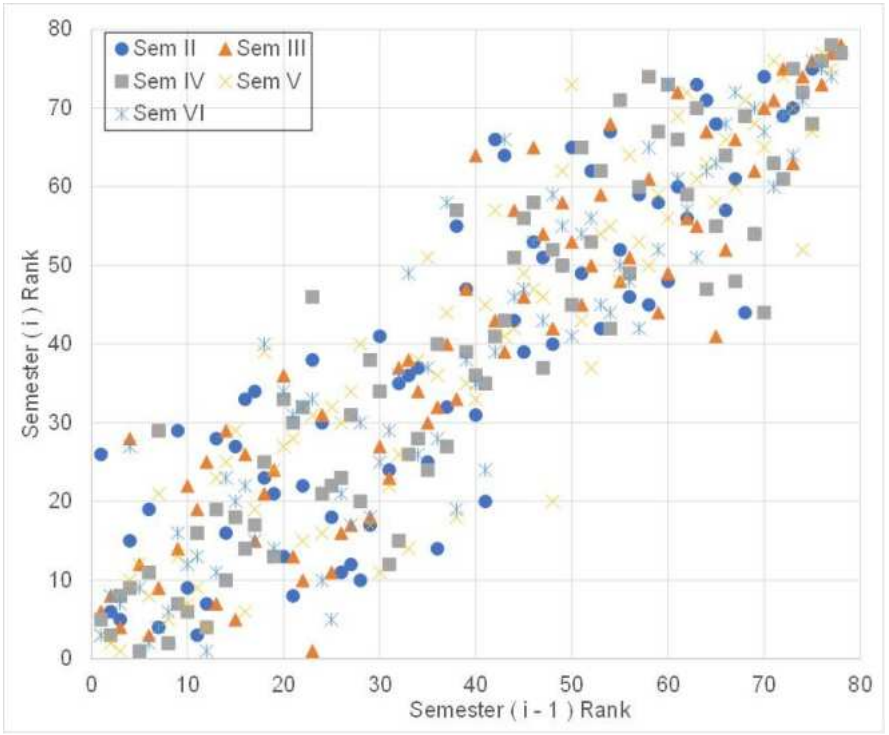
Caution:
Other Points that Syllabus Does Not Address

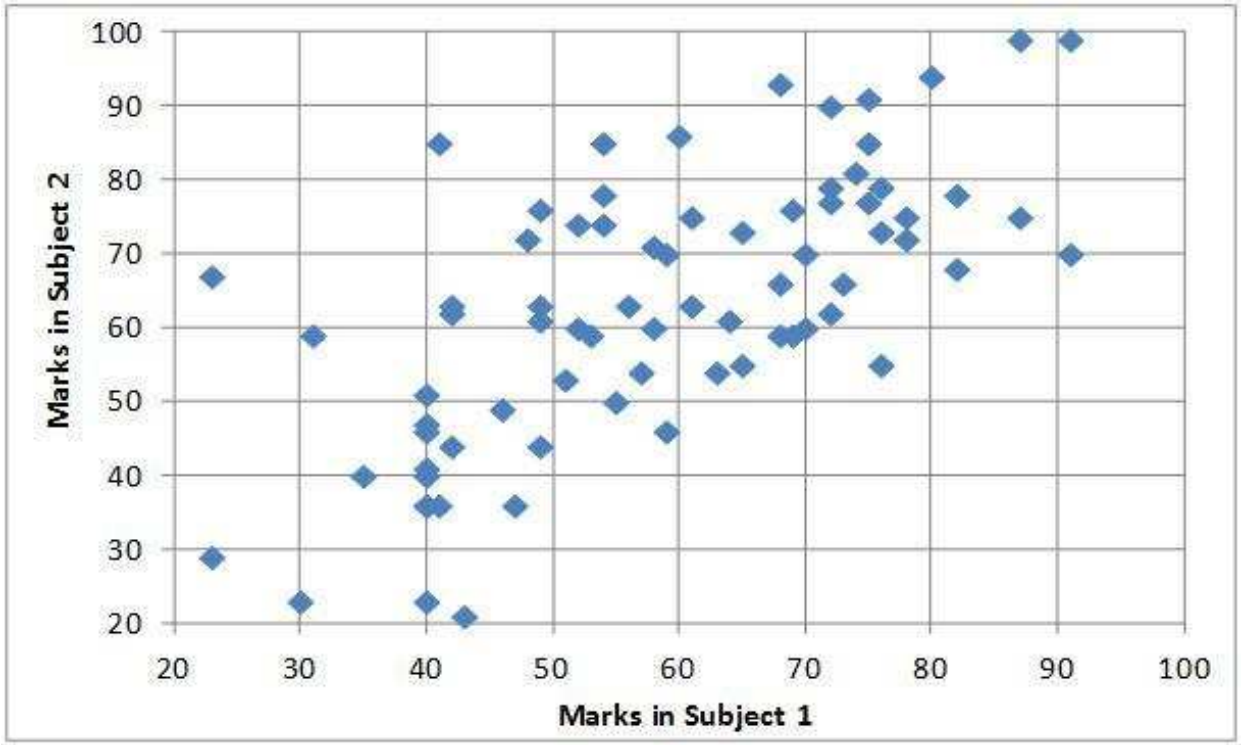
Are Grades a Measure of Abilities?





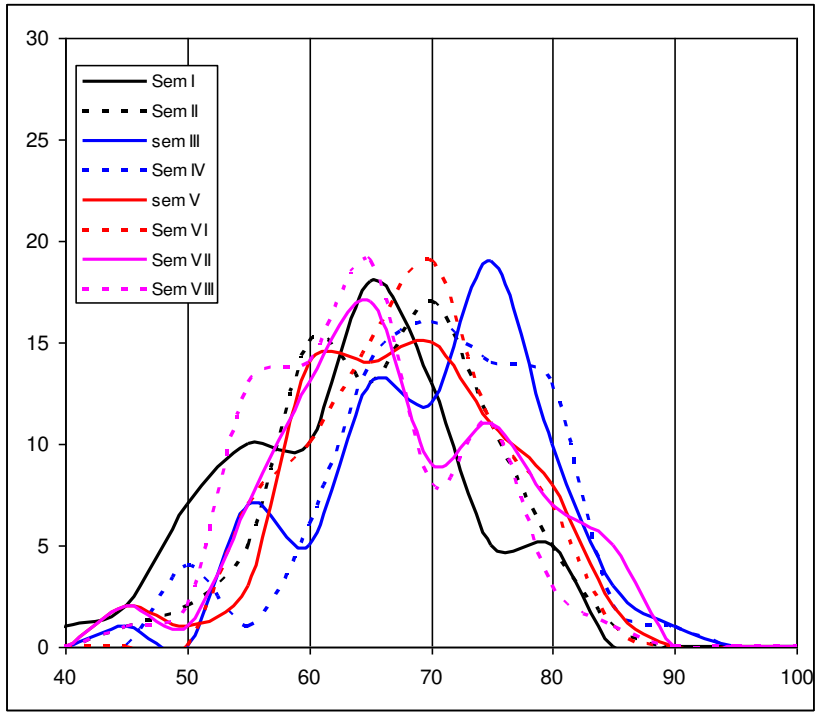
Continued…


Sem II
Sem III
Sem IV
Sem V
Sem VI
Semester (i) Rank
Semester (i - 1) Rank
0
10
20
30
40
50
60
70
80

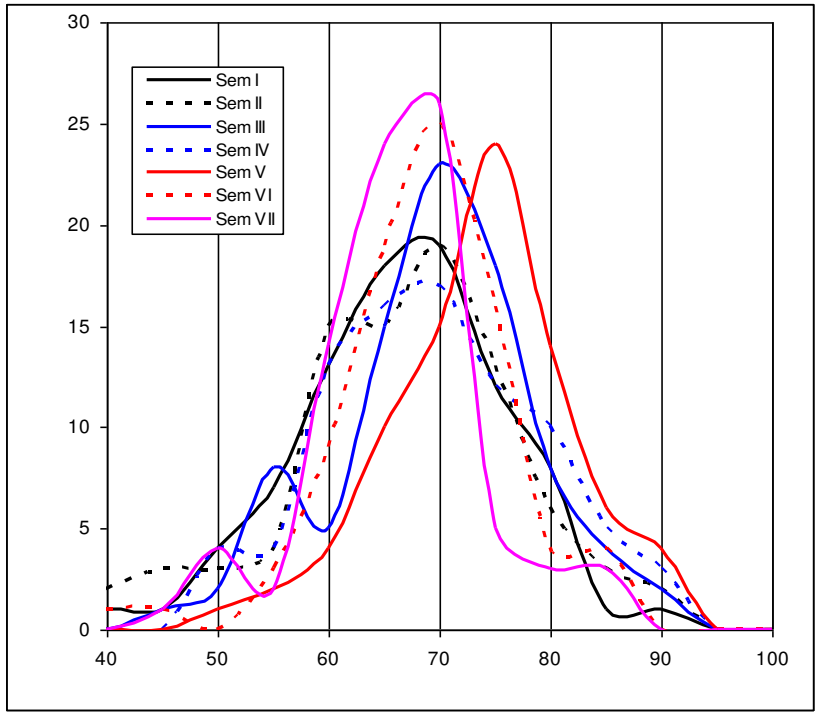

Marks in Subject 2
Marks in Subject 1
20
30
40
50
60
70
80
90
100

Students' Performance

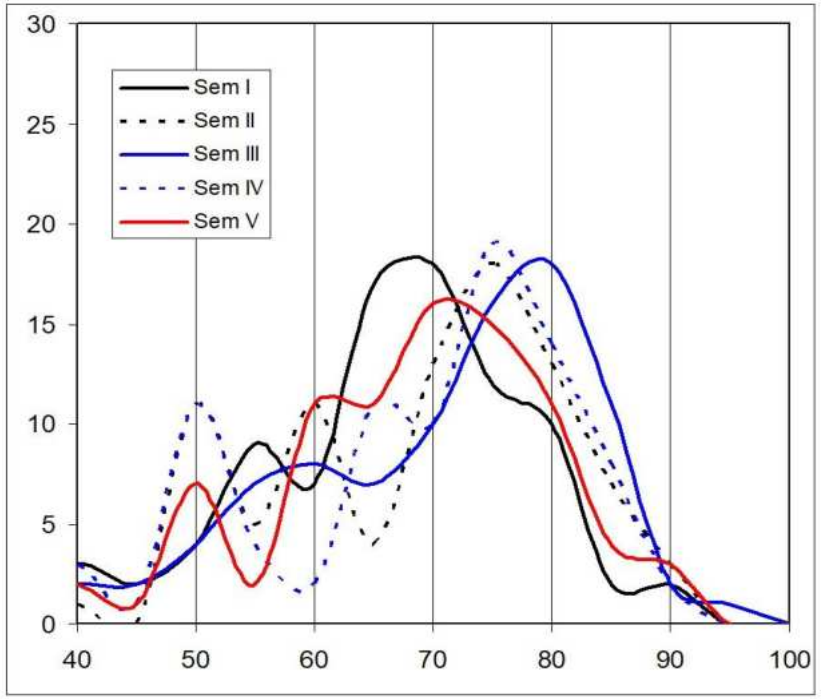
Batch 1



Batch 2



Batch 3



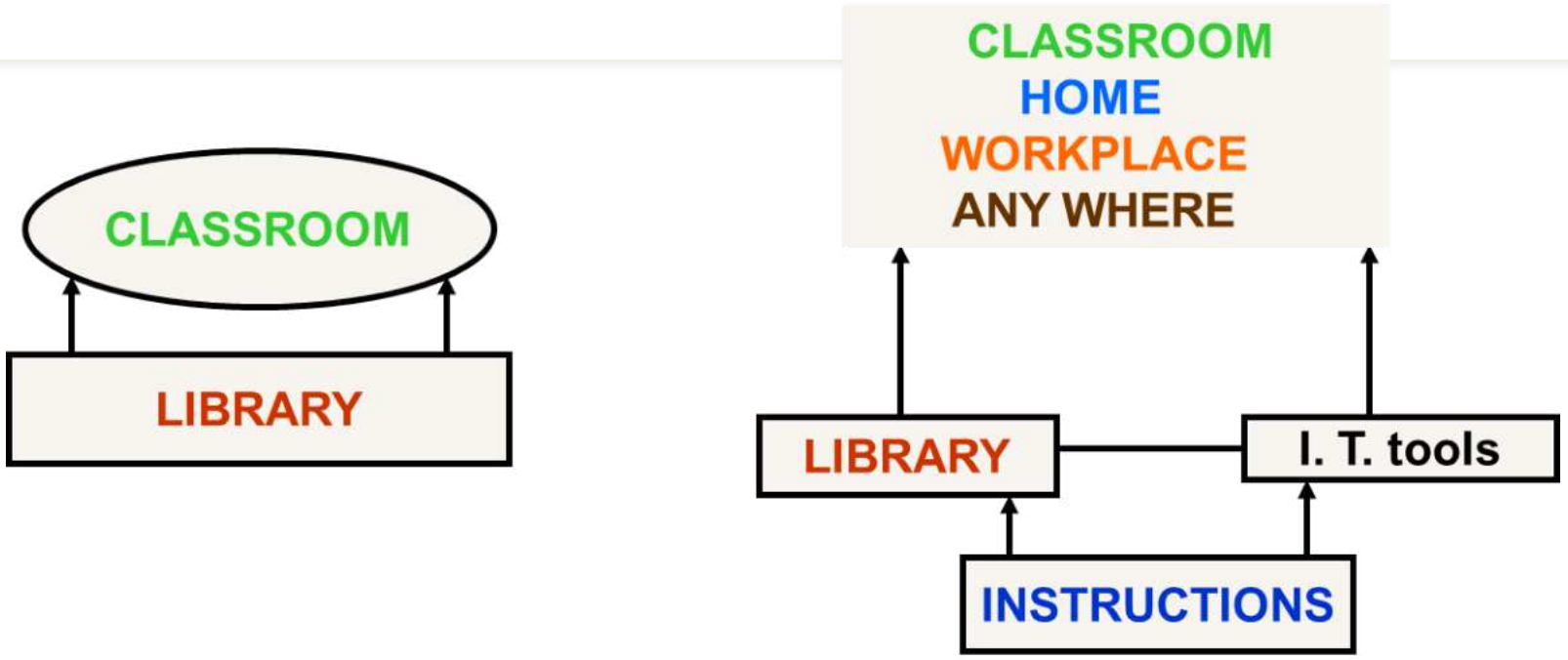
How do Students Learn?

- Felder's Fact 1:
  What we teach > What students learn

- Felder's Fact 2:
  How much as student learns depends on
  - Native ability
  - Background
  - Learning Style

- We can only work with a student's learning style

Learning Process Shift



Physical Learning Environment

Virtual Learning Environment

Changing Role of Teacher

- Learning facilitator
- New instruction material designer
- Information organizer
- Developer of new evaluation and assessment methods
- Explorer of new avenues for knowledge applications
- New Paradigms:
  - “Flipped Classroom”
  - “Maths” versus “Simulation” softwares (ASPEN, MATLAB)
  - “Textbooks” versus “Internet”
  - Teachers will have to be trained in how to teach
  - MOOCs
  - Need based Learning
  - “Teaching” is taking a back-seat in Academics; Just look at the UGC/AICTE Self assessment Form and weightages

Characteristics of Evaluation

Usability:

- Ease of administration
  - Time required for administration
  - Ease of interpretation and application
  - Cost of testing

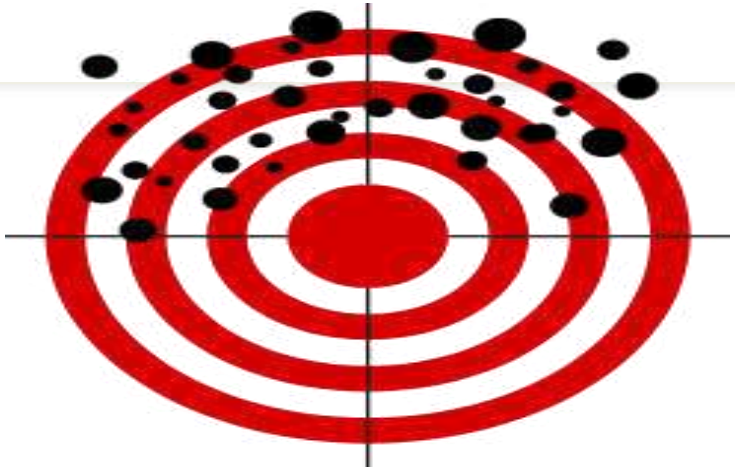
Accuracy:

- Appropriateness of the interpretation of the results of evaluation
  - Is it able to measure attainment of Learning outcomes
  - Is the test performance a meaningful measure ability
  - Will the test performance be representative of some other measure of evaluation

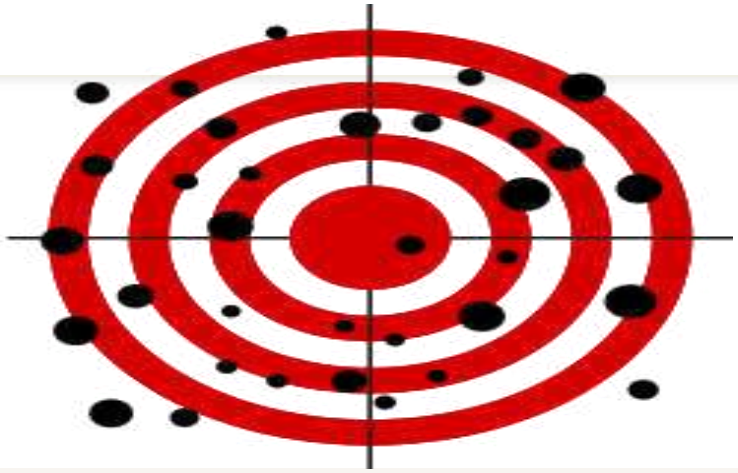
Reproducibility:

- If multiple tests are taken would a particular student score the same?

Accuracy and Reproducibility

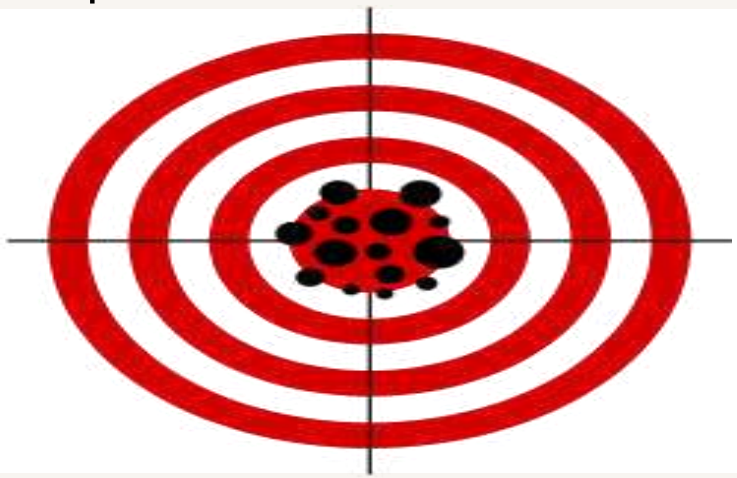


Neither Accurate nor Reproducible



Not Reproducible but Accurate

Reproducible but not Accurate



Reproducible and Accurate

Summary

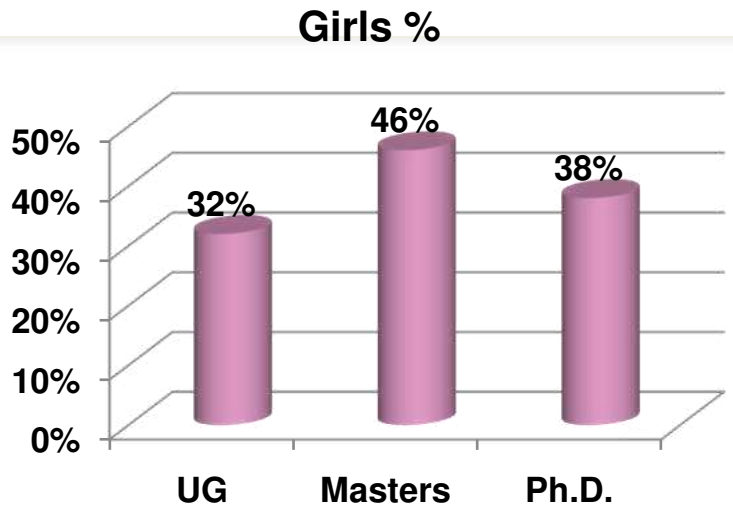
- Curriculum is only a “small battle”
- Bigger Battle is “administering” the syllabus by the individual teachers
- Expected “Knowledge Levels” are not defined in the syllabus document
- Student Evaluations should ensure attainment of ‘Knowledge Levels’ in each ‘Course Outcome’
- Quantification of course outcome is complicated

GENDER EQUITY BEST PRACTICES

Professor Padma V. Devarajan

MOTIVATIONAL APPROACH

- Special PhD fellowship for Girls- Dr. John Kapoor PhD fellowship funded by an Alumnus of ICT
- Special efforts are taken to identify candidates for admission under the UGC Single Girl Child Fellowships
- Leadership roles for girl students: General Secretary, Cultural Secretary, Sports Secretary etc.
- Girl students run a cooperative mess



INCLUSIVE APPROACH

- DST-WOS Fellowship for Ph.D./ as scientist to encourage women with break in career
- DST-inspire Faculty Positions: equal opportunity to women scientists
- UGC Faculty Recharge : equal opportunity to women scientists
- Womens cell as per AICTE norms
- Proactive support: Creche on ICT Campus
- Special annual best mother award: Ph.D. Student and support staff

Creche

Woman's hostel: capacity 352

WOMEN FACULTY AS ROLE MODELS AT ICT AND IN SOCIETY

PROF. SMITA LELE
WOMAN CAMPUS DIRECTOR
NEW ICT JALNA

PROF. PADMA V. DEVARAJAN
1st WOMAN UAA PRESIDENT
PRESIDENT INNOVATION COUNCIL

PROF. REKHA SINGHAL
1ST WOMAN DEAN AT ICT

PROF. LAKSHMIKANTAM
RETIRED DIRECTOR
IICT, HYDERABAD
Dr. B. P. GODREJ DISTINGUISHED PROFESSOR

WOMEN ALUMNI IN BUSINESS - ROLE MODELS

- ICT has produced many successful 1st generation Women Entrepreneurs who are also Distinguished Alumni

Dr. Deepa Bhajekar

Ms. Maharukh Rustomjee

Ms. Susan Josi

Dr. Kailas Thakker

Ms. Pratibha Pilgaonkar

COMMITMENT TO PROPAGATE GENDER EQUITY

CHALLENGES

- The governance of ICT has the tradition of inclusiveness
- Hence there are limited challenges with respect to gender equity
- The only major challenge that we are currently facing is

“Space and funding for additional women hostels”

Best Practices: Innovation

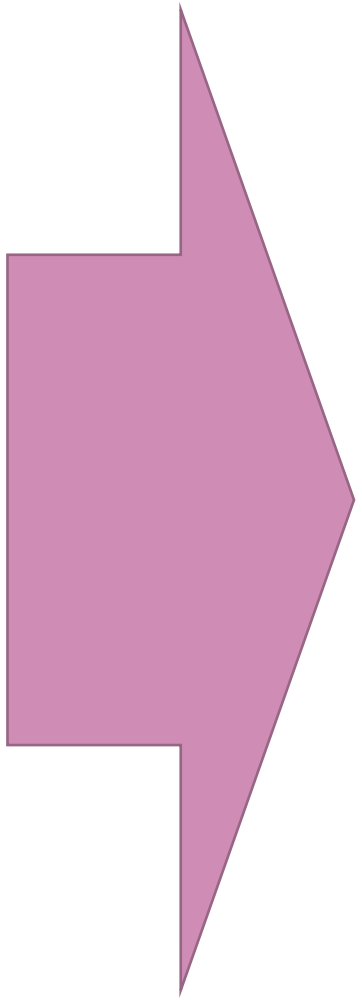
To Spur Innovation at the Institute
of Chemical Technology

ICT Innovation Council

Top ICT Decision Makers
(VC, President Innovation Council, Dean of Research)

Representatives from Industry, Finance and IP
(Directors of Innovative Companies, Finance Orgs, Lawyers, Banking sector, IPR experts)

ICT Professors and Student Representatives from UG and PG student body



Devise and Nurture an Innovation Ecosystem

ICT Innovation Council

Inclusive Approach

- Floating Idea Competition
- Identifying potential students
- Mobilization for participation
- Motivation of students
- Mentoring support
- Hand holding

ICT Innovation Council

- Innovation and IPR Training
  - Semester Long Courses
  - Workshops
- Industry Defined Problems
  - Real Problem Posed By Real Companies for Real Money
- Innovation Competitions
  - Smart India Hackathon
  - Entrepreneur's Blueprint
- Innovator Meets
  - E-Summit, Fireside Chats
- IP Clinics
- Innovation Exhibitions

Hackathons

Smart India Hackathon 2019

22 teams registered and 3 prizes won

- ✓ Hackathon Problems carefully curated by faculty
- ✓ Curated problems presented to students and rules of hackathon explained a half-day workshop
- ✓ Each problem has a suggested faculty researcher that students can approach. IIC facilitates this contact
- ✓ Resources for prototyping are supported through TEQIP and from a Seed Fund created through a generous donation from an Alumnus

Electrodialysis

Cryogenic Grinding

CO_2 Utilization

ICT Innovation Council

MHRD-AICTE PoC Innovation Competition 2019

Best Innovation Prize (2019)
Mr. Amit Lokhande (PhD Student) for Veterinary Diagnostic tool- Pregnancy Determination in Cattle.

The POC on a Point of care Blood Group Detection Kit (Pooja Todke) was ranked number 9.

Amit and Pooja are conferred status of INNOVATION AMBASSADORS

Amit has received funding from MHRD-AICTE for Pre incubation of the idea.

Plans to spin off a company with his mentor Prof. Padma. V. Devarajan after getting his PhD.

ICT start-up policy

- ✓ Best Practices from Across the Nation
- ✓ Clear and Unambiguous
- ✓ Roles, Privileges and Responsibilities clearly delineated
- ✓ Full support for faculty and students towards spinning off technology

Peroxane Technocrats Pvt. Ltd.

- ✓ Winner of University Challenge 2018 at IIGP 2.0
- ✓ Winner of Open Innovation Challenge 2019 organized by DST - Lockheed Martin - Tata Trusts 2019

GermSafe Technology LLP

- ✓ Winner of Gold Category of Aarohan Social Innovation Award by Infosys Foundation 2019
- ✓ Signed an MoU with IOCL as a part of Indian Oil Start up scheme in 2019

Best Practices - Innovation

- Have a body dedicated to nurturing innovation
- Constantly organize events to keep innovation and entrepreneurial juices flowing
- Facilitate intense interaction between students and research faculty
- Support students with training and resources for building prototypes
- Involve representatives of all stakeholders in major decision making
- Involve top minds in business and entrepreneurship in deciding policy
- Keep all policies as clear and unambiguous as possible

Best Practices: Alumni Role

Professor Padma V. Devarajan

Activities

Enhancing Public Perception of ICT

Infrastructure upgradation

Instituting Awards

Loans to needy students

Assistance for factory visits

Assistance in job placements

Mentoring students

Supporting Institution level events

Organizing lectures & seminars

Managing the Alumni network

Support to non-teaching staff

Laboratory infrastructure

Aim	• **Modernization of undergraduate laboratories with critical instruments/equipment**
UAA Role	• **Identify needs in each Department** • **Allocate funds and facilitate purchase**
Donation	• Over a crore from Alumni

Summer internships

Aim	• Support summer internships at ICT [Typically six weeks, research for UGs]
UAA Role	• Select students • Provide financial support to students & contingency funds
How alumni help?	• Suggest projects that can be taken up • Provide funding support

Certificate course in ‘Practice of Chemical Technology’

Aim	• Strengthen courses with industry relevant subjects to provide students a competitive edge • Facilitate courses in soft skill development
UAA Role	• Identification of appropriate faculty • Developing course content • Organize financial & other resources required
Status	• Course content, faculty and operational details finalised and presented to ICT • Fourth batch of >50 students enrolled and in progress

Enhancing Public Perception
UDAAN

UDAAN

UDCT Alumni Association Newsletter

August, 2018

UAA

BOARD OF GOVERNORS (2017-2019)

Office Bearers:
Prof. Padma Devarajan
President
Mr. Ravi Raghavan
Imm. Past President
Mrs. Maharukh Rustomjee
Sr. Vice President
Mr. Dilip Udas
Vice President
Dr. Parag Gogate
Hon. Secretary
Mr. Rajeev Panse
Hon. Treasurer
Prof. Sunil Bhagwat
VP-TA Ex-Officio Member

Members:
Mr. Yashwant Jhaveri
Prof. Shreerang Joshi
Mr. Nilesh Lele
Dr. Tipanna Mariyappa
Dr. Sanjay Mehendale
Prof. Anand Patwardhan
Dr. Dhananjay Rane
Mr. K. Sahasranaman
Mr. Vijay Sane
Mrs. Lakshmi Venkatesh

Co-opted Members:
Mr. Sumit Gupta
Dr. Uday Lajmi
Ms. Deepali Magadum
Ms. Purnima Parkhi

Editors:
Ms. Divya Jayaram
Mr. Ravi Raghavan
Mr. K. Sahasranaman

Email:
editors.udaan@gmail.com

UDCT Alumni Association (UAA) is a Public Charitable Trust.
UAA is registered under Section 80-G of the Income Tax Act, 1961 with effect from 30-1-2004. This 80-G Certificate has been extended in perpetuity vide Income Tax Department Circular No. 7/2010 dated 27-10-2010.

President's Message

प्रथमवयसिदत्तंतोयमल्पंस्मरन्तः
शिरसिनिहितभारानारिकेलानराणाम्।
सलिलममृतकल्पंदद्युराजीवनान्तं
नहिकृतमुपकारंसाधवोविस्मरन्ति।।
- सुभाषितम्

This shloka stresses on gratitude – that one should fondly remember any noble service done unto him by anybody anytime, feel grateful, and also do some noble service in return.

Dear Alumni,

One year as President has gone by and this is an opportune time to reminisce the happenings at UAA. It has been a mixed year, with a flow of positive energy that has propelled forward numerous new activities to support ICT, juxtaposed with small hiccups. The year has witnessed important events that chart the progress for our alma mater.

A hallmark event is the introduction of the Annual UAA Named Oration facilitated through a very generous corpus donation from Shri K.V.Mariwala, the Founder President of UAA and Distinguished Alumnus. This oration while celebrating the great luminaries of UDCT/ICT unfolds to the current generation the heritage and glory of our alma mater. The inaugural Prof. K.Venkataraman Oration delivered by Padma Vibhushan Prof. M.M.Sharma with Padma Bhushan Dr. Rama Rao introducing the audience to the sterling contributions of Prof. Venkataraman, was electrifying and has set the benchmark. Donations to upgrade laboratories and even refurbish and renovate laboratories were supported by alumni.

Our Alumni have been allured to come back and give back. The Tete-a-tete with Distinguished Alumni was a huge success with students and alumni enthusiastically participating. A first time innovation competition for students wherein students highlighted their innovative research in just 3 minutes, was judged by our alumni. The new alumni-Student mentoring programme for students will see our alumni participating in large numbers.

A fruitful year where existing activities have gained momentum and newer dimensions of support were envisaged. Proactive support to students in internships and placements and image building to expand the public perception of ICT to help it spiral upward in the NIRF ranking are some major activities to be initiated. This needs support with contacts, manhours from alumni and financial support. Come, extend your hand dear alumni!

The annual general meeting scheduled on August 31, 2018 at 5.30pm, will be preceded by a very interesting lecture on wildlife conservation by our own Distinguished Alumnus Dr. Anish Andheria. Do join for a mesmerising experience with Anish.

Padma V. Devarajan, President - UAA
Email: president@udctalumni.org.in

- E-magazine published regularly every month for past four years
  - Editor: BOG Member, K. Sahasranaman
  - Assistance of alumnus, Youthika Chauhan & Ms. Divya Iyer
- Readership
  - >5,000 alumni + Students
- Record of:
  - BOG initiatives
  - UAA/ICT activities
- Celebrating achievements of:
  - Alumni
  - ICT & its faculty
  - Students

Continued Alumni Engagement

Distinguished Alumni Awards

- Academics
- Professional
- Entrepreneur
- Research
- Extramural
- Young Achiever

INSTITUTE OF CHEMICAL TECHNOLOGY

What makes ICT unique?

VG Gaikar
Former VC, DBATU and BPCL Distinguished Professor, ICT

ICT

strategically strives to be

A World Class **Resource Centre in Education, Research and Innovation**
leveraging the strength in Research and Technology Development

ICT encourages excellence

ICT acts as bridge with Industry and Society

ICT disseminates knowledge to all

ICT networks with others to build symbiotic relations

Human Resource Development Best Practices

Staff

Admin, Finance, Academic, Technical, Laboratory

Each function needs different skills which have been identified and provided for

Faculty

Established & New Faculty

Academic, Administration, Research

Collaboration

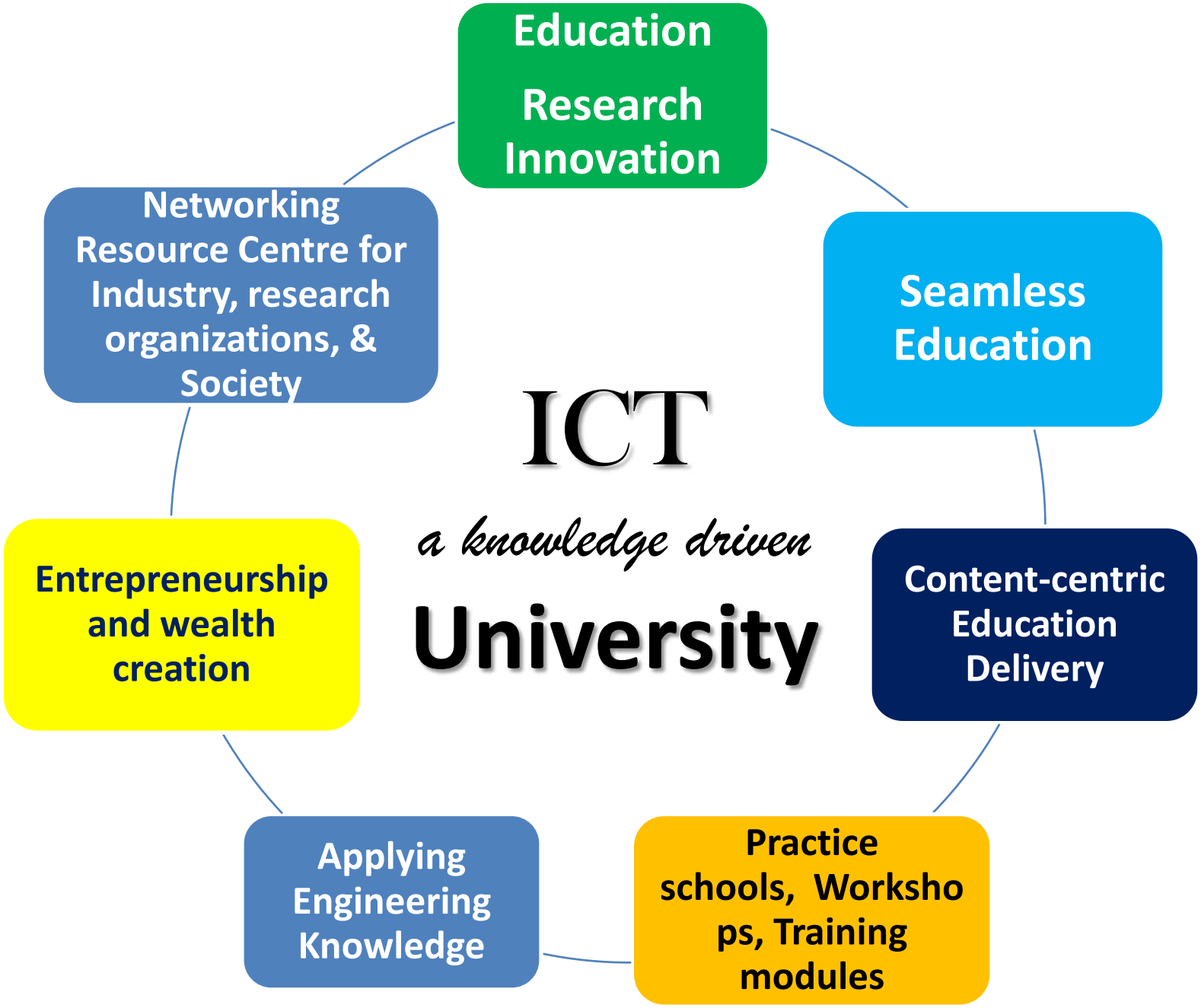
Students

UG, PG, PhD, Post-Doc

Skills

Innovation

Entrepreneurship


Education
Research
Innovation
Seamless Education
Content-centric Education Delivery
Practice schools, Workshops, Training modules
Applying Engineering Knowledge
Entrepreneurship and wealth creation
Networking Resource Centre for Industry, research organizations, & Society
ICT
a knowledge driven
University

ICT as a vibrant hive of many Centres of excellence

Research is IDEA based…

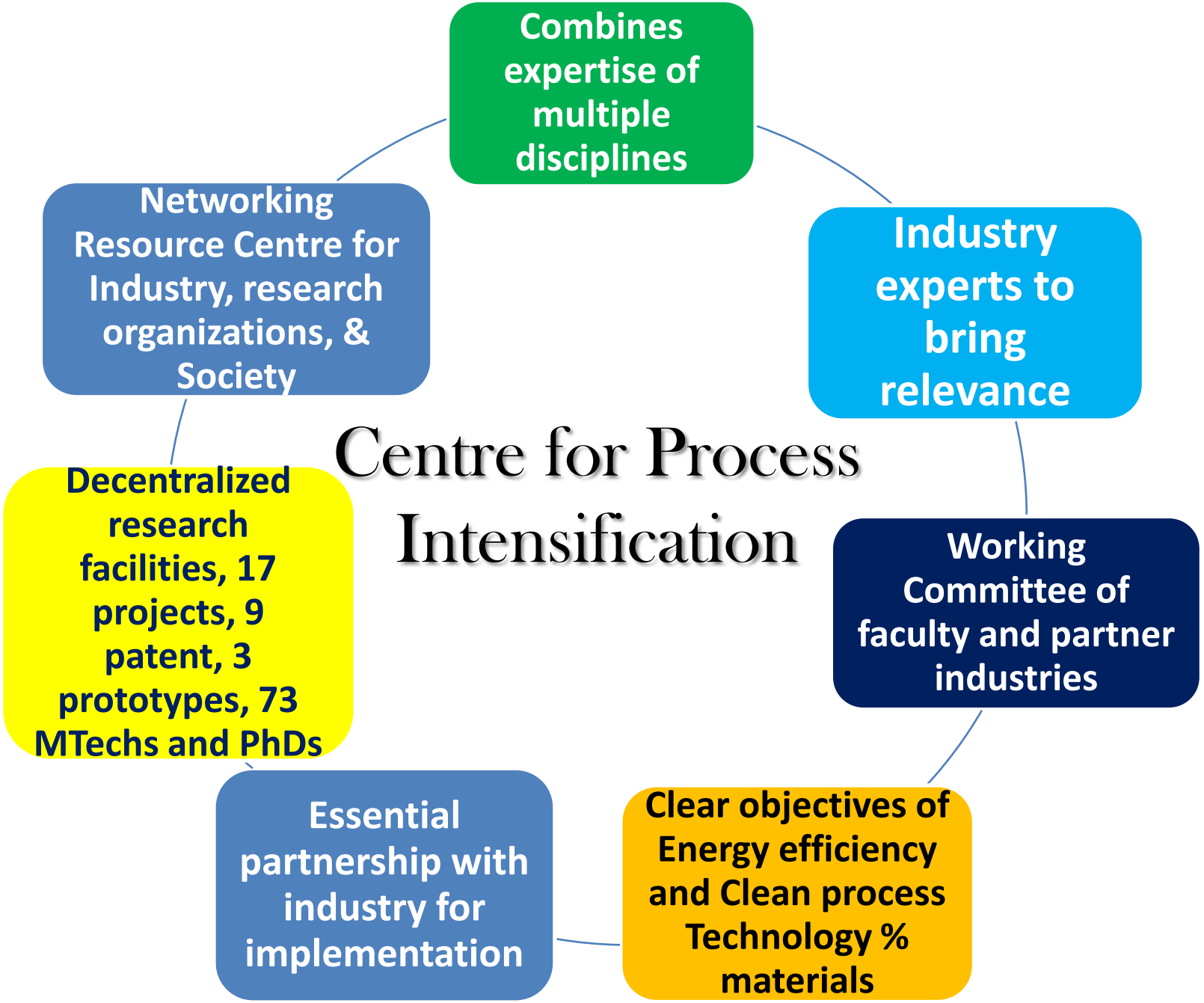
not equipment based

…Need drives innovation….

Sustainable Research Culture

Centres of Excellence

- Synergistic approach by combining expertise
- Multidisciplinary culture of learning in research
- Generation of funding from Government agencies and industry on competitive basis
- Networking Resource Centre for collaboration, science and innovation
- Utilization of research through technology transfer and start-ups


Combines expertise of multiple disciplines
Industry experts to bring relevance
Working Committee of faculty and partner industries
Clear objectives of Energy efficiency and Clean process Technology % materials
Essential partnership with industry for implementation
Decentralized research facilities, 17 projects, 9 patent, 3 prototypes, 73 MTechs and PhDs
Networking Resource Centre for Industry, research organizations, & Society
Centre for Process Intensification

INnovation Networking of TEQIP Institutes

TECHNICAL EDUCATION QUALITY IMPROVEMENT PROGRAM

Synergise Strengths of Collaborating Institutes

INN

Veermata Jijabai Technical Institute, Mumbai

Textile

Sardar Patel College of Engineering, Mumbai

Mechanical, Electronics
Electrical, IT

Dr. Babasaheb Ambedkar Technological University, Lonere

Mechanical, Chemical, Electrical

SGGS Institute of Engineering and Technology, Nanded

Mechanical, Electronics

Chemical & Biochemical

Preparations-Human Resources

INN

We involved a number of Interns

ICT:	30
SPCE:	65
DBATU:	45
SGGSIET:	20
VJTI:	10

- Total 25 projects
- Initial funding: 3 crores
- Patents filed: 15
- Technology transferred so far: 1

Team Work

Objective of involving interns was to train the young generation in planning and design of innovation projects and build their capacity for future challenges

Preparations- Discussions and Networking

INN

- Continuous discussions between faculty members and students of all partner Institutes e-Group
- Frequent visits between the Institutes

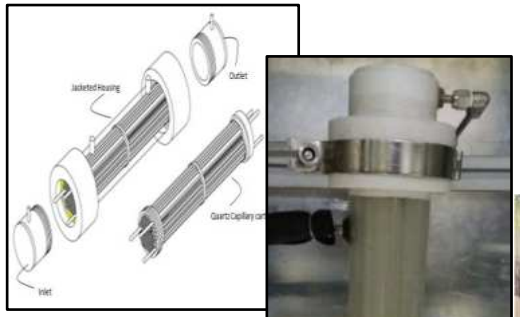
Design and Planning for each Project

INN

- Design stage- Detail Plans uploaded on the common e-group.
- Project planning
- Requirements along with time lines
- Bar-chart of deliverables
- Mechanical and Electrical Designs
- Bill of materials for each project
- Micromanagement of purchase and inventory
- delivery to institutes
- Building the components
- Organization of prototype and delivery of products
- Demonstration of prototypes

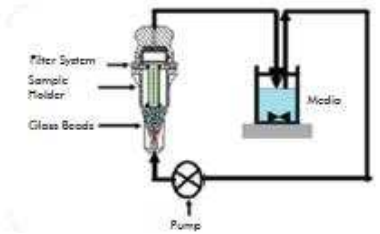
Results....? ..Final Products

INN



quito repellent shrug, Mosquito Repellent Gamcha and Mosquito Repellent Dupatta

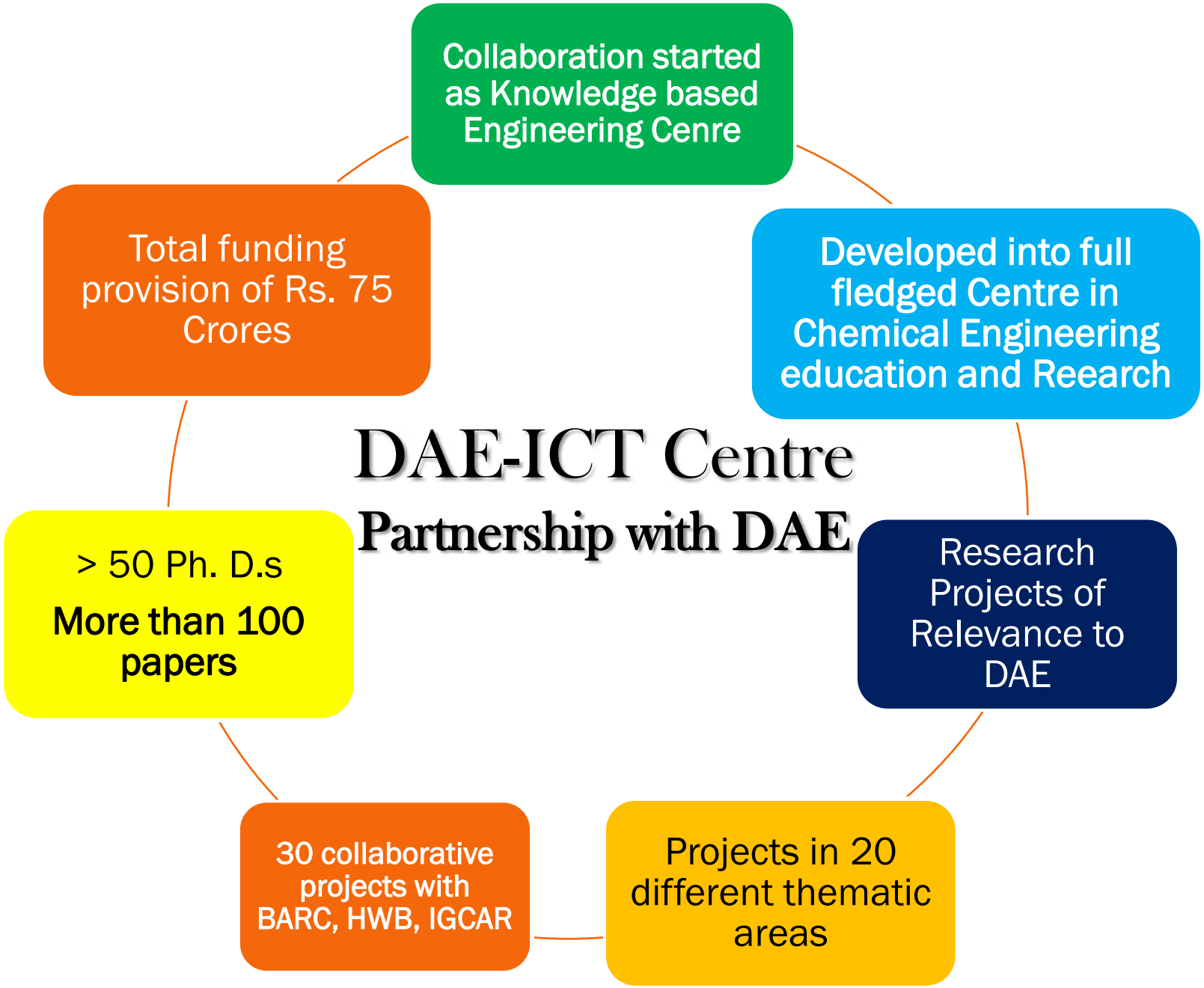
Fabricated Mobile Blancher unit for Turmeric processing and Steam Water Separator with Insulation Cover and CPC Panels



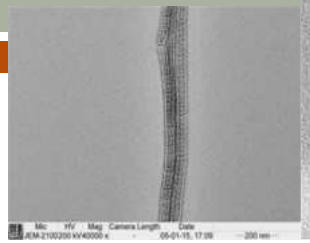
We build confidence in young generation

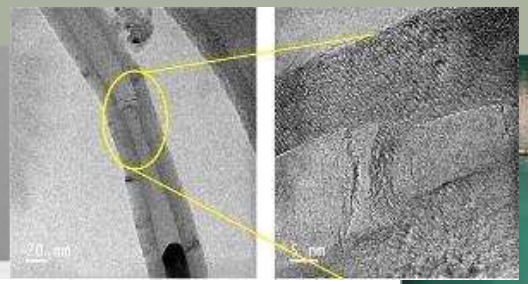
We can do it again…and again.

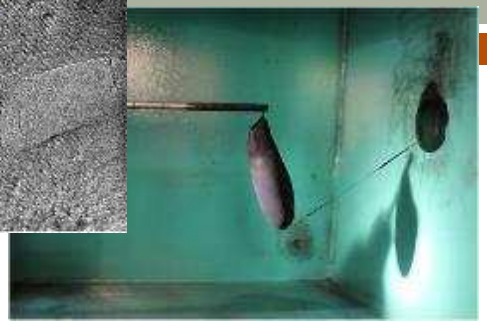
- Involvement of UGs in the program- trained in necessary skills as per the projects
- Triggering interests among the students for doing something different
- Team spirit in progress of the project
- Direct application of engineering and scientific principles
- Learning by experience for all participants
- Understanding of all facets of project- design, materials, fabrication, finance, purch ase, testing, interdisciplinary input, accountability, deliverables
- Several offshoot projects from the partner institutes
- Interest generated in other institutes
- Possible Entrepreneurs from the participants
- An immensely satisfying experience

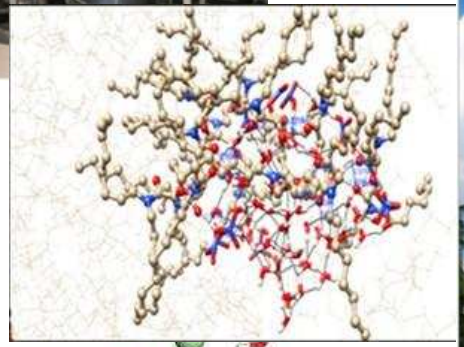

Collaboration started as Knowledge based Engineering Cenre
Developed into full fledged Centre in Chemical Engineering education and Reearch
Research Projects of Relevance to DAE
Projects in 20 different thematic areas
30 collaborative projects with BARC, HWB, IGCAR
> 50 Ph. D.s
More than 100 papers
Total funding provision of Rs. 75 Crores
DAE-ICT Centre
Partnership with DAE

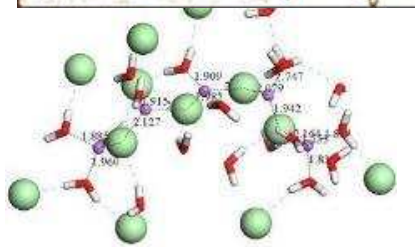
The Centre & Research Areas

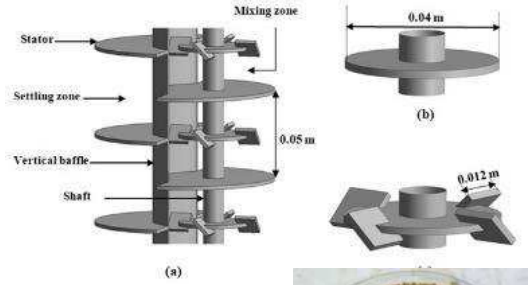


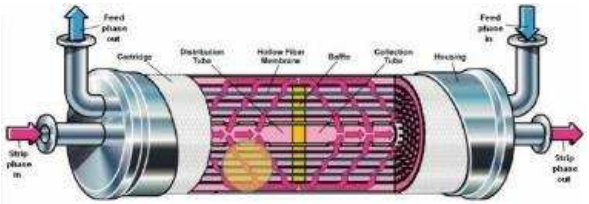


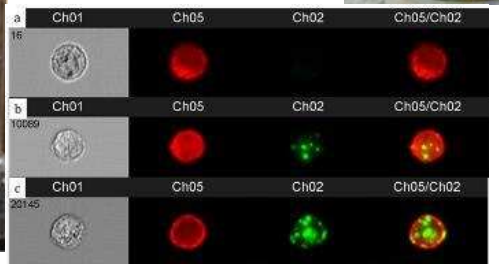












DAE-ICT Centre in Chemical Engineering Education and Research

- **Phase III R&D Activities**
  - Front End of Fuel cycle
  - Fuel Reprocessing
  - Advanced and New Generation Reactors
  - Advanced Technologies related to the field of Energy
  - Societal and Medical aspects of Radio-isotopes
  - Hydrogen production and storage
- **Completion of the Building construction**
- **Generation of Human Resource**: 20 Ph. D. fellowships per year
  - Joint guidance by ICT faculty and Scientific Officers from DAE
  - Joint Patents and Papers

(~10 projects running at any point in time)

What makes ICT different?

Symbiotic Relationship with Chemical Industry

Sponsored Research Projects

Faculty chair endowments

Faculty members on the Board of Industries

Advisory Consultation with Industries

Technology Transfer for improving competitiveness of Industries

Industry experts on ICT's Advisory Committees and Examination Panels

Visiting faculty from Industry

Training programs for Industry personnel

Improvement of qualification for industry personnel

Advice on trouble shooting

We pass the benefits to society

Water treatment technology for lakes, and ponds (e.g. Rankala waters, Red water in Mumbai)

Development of Mosquito Repellent Textiles for infants/kids

Affordable Drug Delivery systems

Waste-to-Assets Technologies (Waste Plastics, Industrial waste, Biomass)

Solar cooker and Eco-cooker,

Improved cooking methodologies

Health foods and Nutraceutical formulations..

Safety Impact on Industrial Operations- Public awareness

Training of Students and Faculty of other Engineering Institutes

Affordable services for Sophisticated Analytical Instruments to researchers

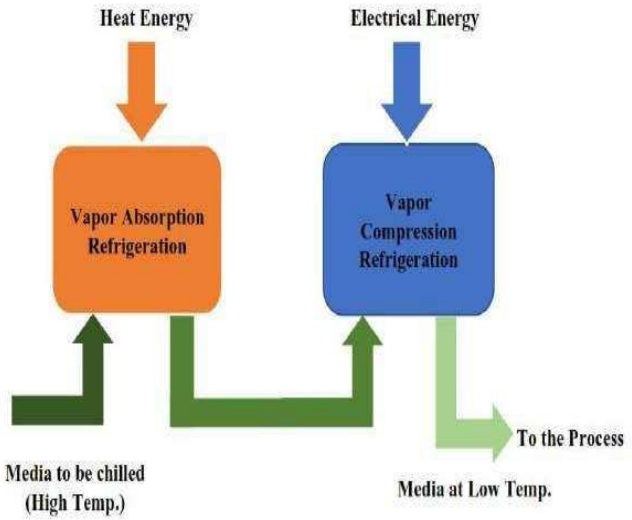
Education at affordable cost- 306 Merit-cum-means scholarships provided at UG levels

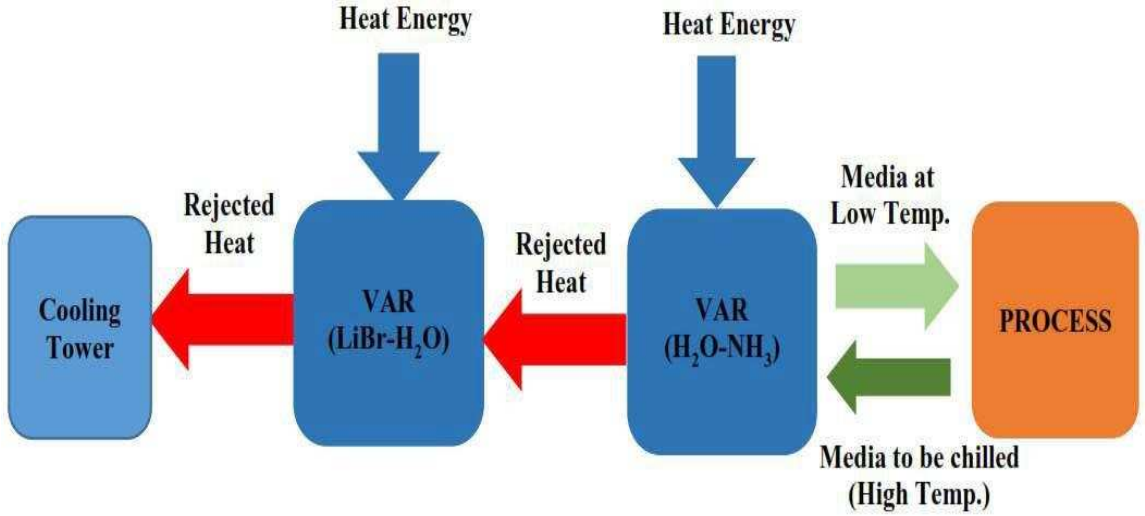
Faculty members are advisors to several Government organizations and industrial organizations for Corporate Social Responsibility

Hand pump design for Rural India

ro Electr
Genera
tion usi
Canal ar
n

Combined Vapour Absorption/Compression Refrigeration





Combo VAR-VCR Technology, Gokul Dairy, Kolhapur

The evaporator of LiBr/H_2O Vapour Absorption Refrigeration unit is connected internally to the condenser or absorber of Ammonia Vapour Absorption Refrigeration Cycle (AAR) unit

SELF-Assessment

Challenges

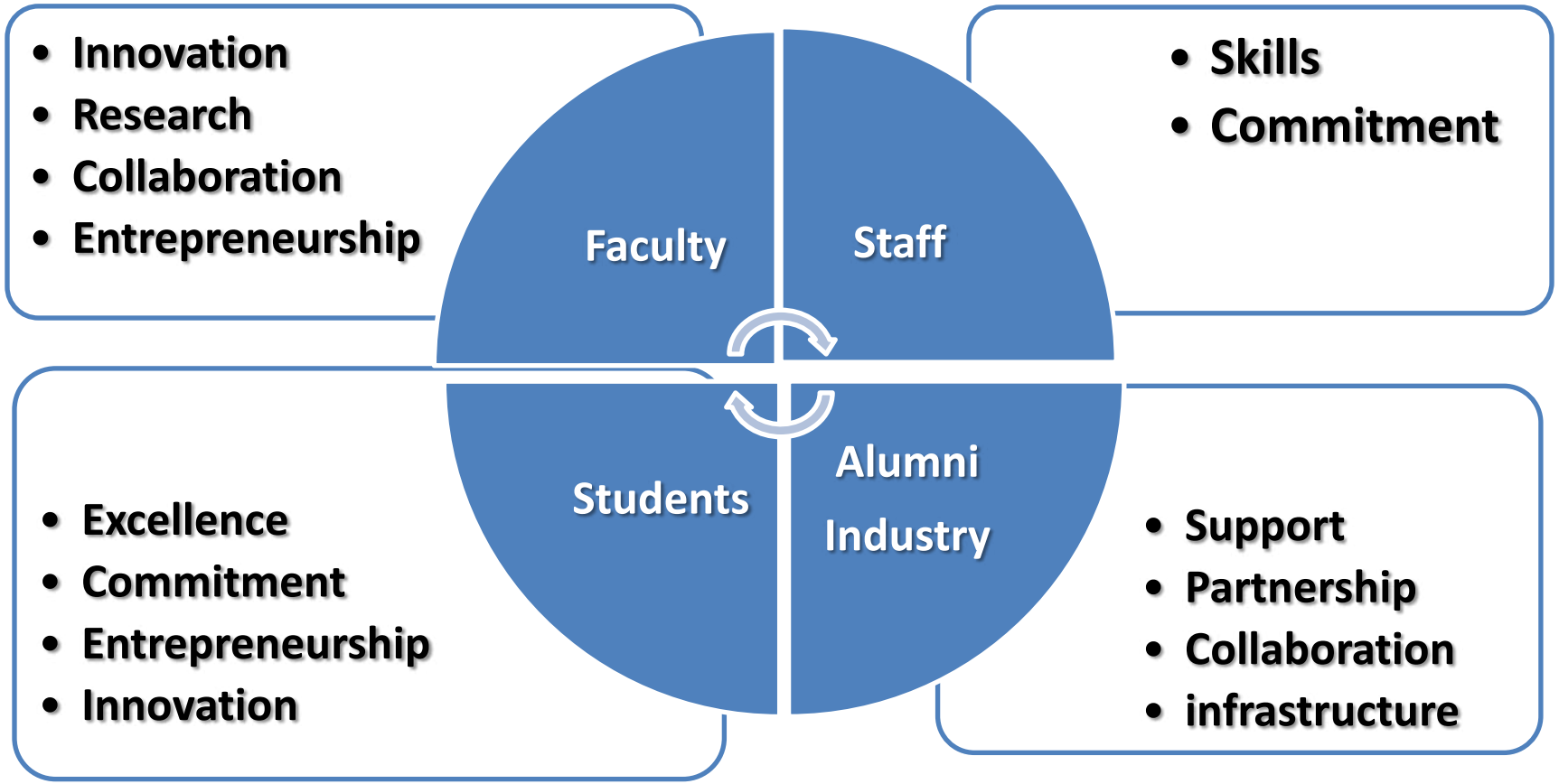
- Sustaining the activities and Continuous generation of funding
- Attracting industries to adopt technologies
- Maintaining IPR
- Slow pace of infrastructure development
- Dedicated research infrastructure for UG students to work on the ideas
- Funding for skill development workshops at collaborating Institutes

Sustainability Planning

- Take Research project outcome to pilot scale studies and commercialization
- Discussion with potential industries to transfer the technology
- Consortium with Industry to take projects of industry's interest and generate funding. The off-campus of ICT in Bhubaneswar, is in association with IOCL. The Off-campus unit will take up research activities relevant to IOCL in addition to education
- Development of new research project plan for next ten years with joint discussions with organizations like
  DAE, MNRE, DST, etc.

Strategic Plan of ICT

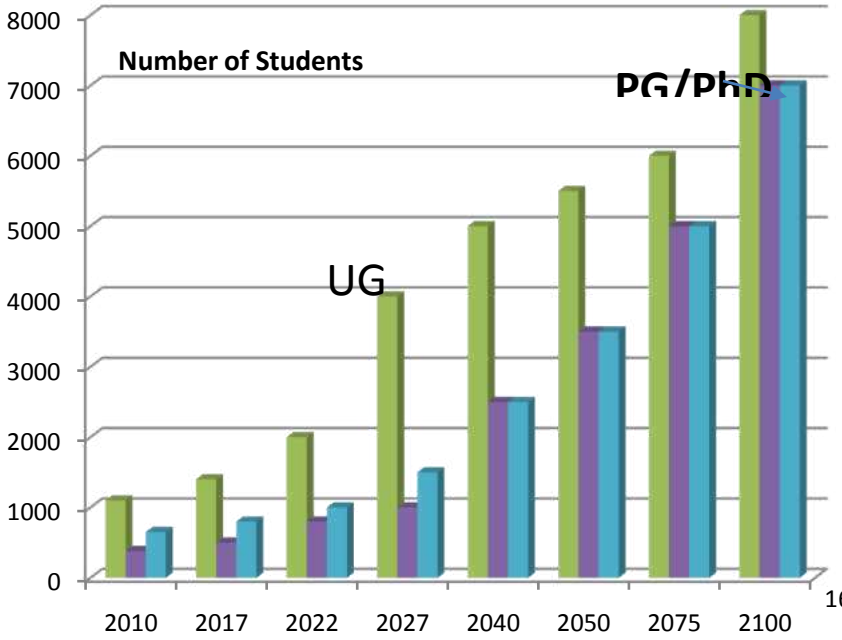
to establish ICT as a World Class **Resource Centre in Education, Research and Innovation**
leveraging the strength of ICT in Research and Technology Development

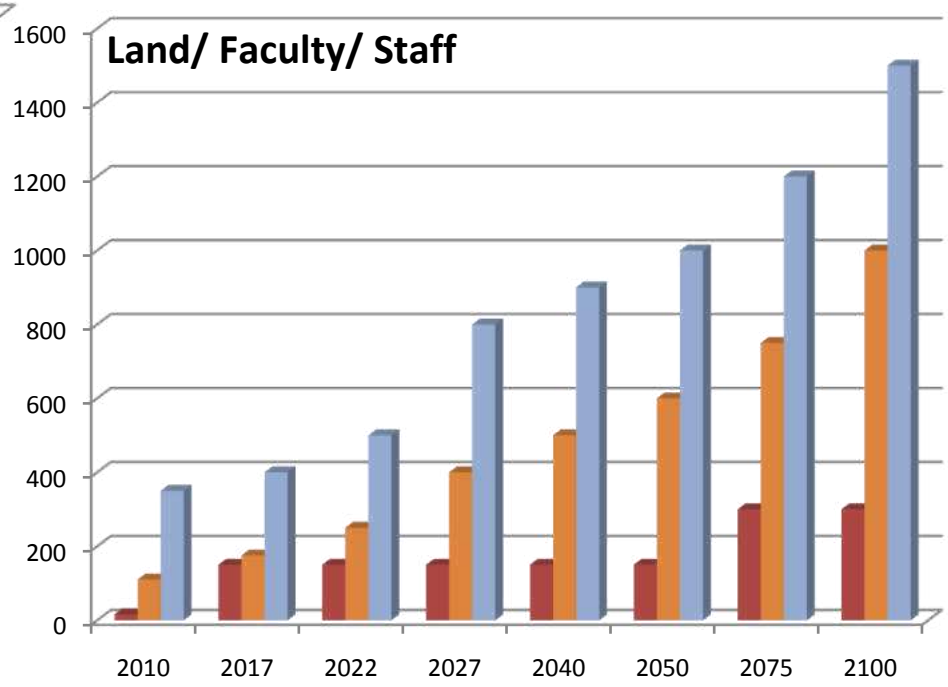


Strategic Plan

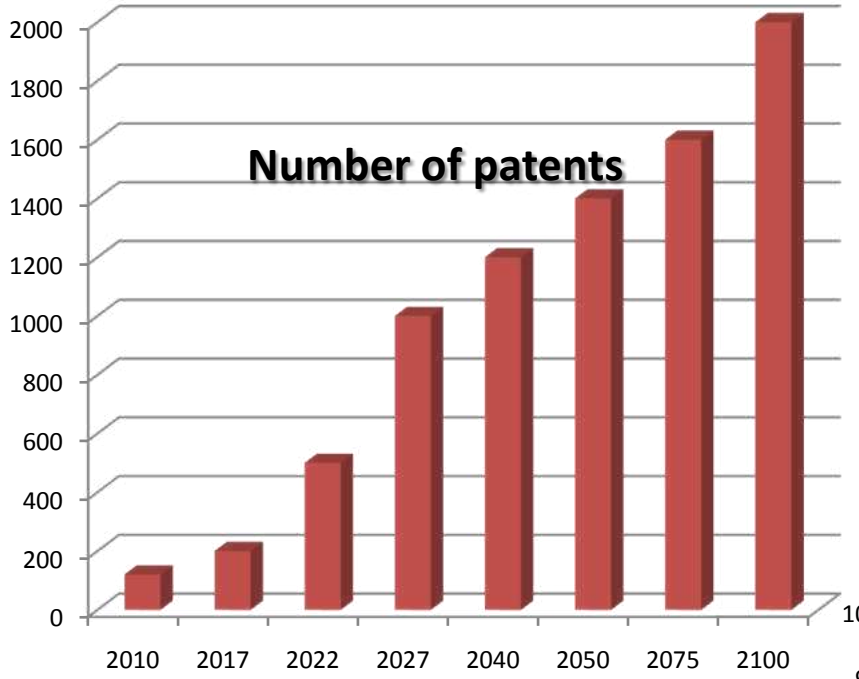
- Theme based Technology Centres, **Innovation policy**.
- Leveraging the research activities for **technology development** for industry and society and corpus building for own sustenance.
- To be a **Networking Resource Centre** for promoting
  Science, Technology, Collaboration, and innovation
- Maximizing **human resource** development
- **Leveraging latest developments** in other engineering disciplines

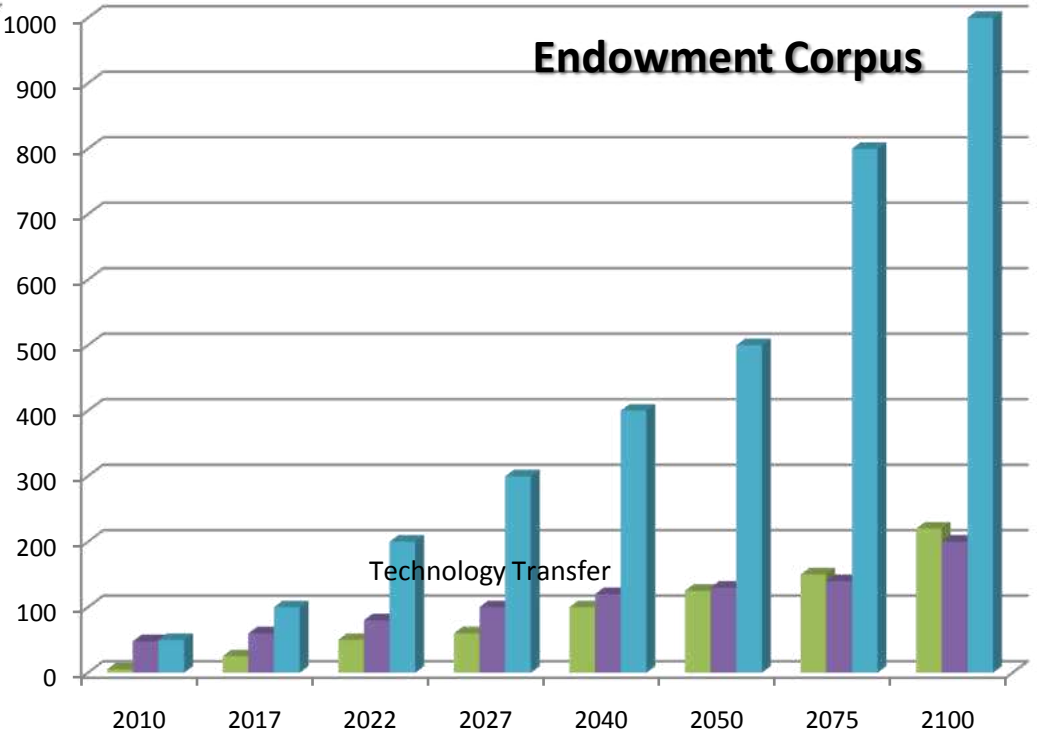
PROJECTED DEVELOPMENT Of Institute of Chemical Technology





Resource Generation for ICT in coming years by Intellectual Property Rights And Interaction with Industry





We anticipate changes in education and technology and act more earnestly

THANK YOU