Building Entrepreneurial Ecosystems: Role and contribution of Universities

An update on attempt to promote Panjab University as a Hub for such an Ecosystem

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British East India Company had no clear thinking/policy for (Higher) Education up to 1854 for students studying in 280 High Schools and 28 Colleges all across territories under their control/influence.
Regulation of Education in Colonial India

- **1849:** British annex Punjab
- **1854:** Sir Charles Wood’s despatch calls for enunciation of system of education from Primary School to University level.
- **1856:** Directors of Public Instruction (DPIs) appointed to regulate Schools in all regions of British controlled India. (1% Land tax to be spent for new Schools in Punjab)
- **1857:** 3 Universities commenced at Presidencies of Calcutta, Bombay and Madras as affiliating and examination bodies. Univs. start College Entrance Exams.
Higher Education 1904 onwards

- 1904: Indian Universities Act for all 5 Univs. (Calcutta, Madras, Bombay, Lahore & Allahabad.)
- Universities empowered to appoint Professors & Lecturers, and asked to undertake Research, motivate students to learn skills and become self employed and not merely seek low level Government jobs
- 1904 onwards: College Teachers allowed Study Leave for higher studies and Research
- Faculty from England invited to India for extended stays in ‘Cold Months’ *(a la GIAN Scheme of MHRD initiated in 2014)*
Universities in pre-independent India

- 1857: Calcutta, Bombay and Madras
- 1882: Panjab University (Lahore)
- 1887: Allahabad
- 1909: IISc. Bangalore
- 1916: BHU & Mysore
- 1918: Osmania (Hyderabad)
- 1920: AMU@Aligarh, Rangoon University in Burma
- 1921: Lucknow & Dacca; Also, Visva-Bharati
- 1922: Delhi
- 1923: Nagpur & Andhra (Waltair)
- 1927: Agra
- 1929: Annamalai
- 1943-47: Utkal (43), Sagar (46) & Rajasthan (47)
Research papers published in 1926 by Dr. S.S. Bhatnagar and his students from Panjab Univ. Chemical Laboratories, Lahore


A very small weight of the substance, of the order 0.01 gm., a change in diamagnetic susceptibility of the order of 0.2 per cent or even less can, therefore, be easily detected.
His Excellency Sir Henry Craik, Governor of the Punjab at the Annual Lunch of the Northern India Chamber of Commerce, Lahore, 13th April, 1940

• “There is every reason to suppose that the war will give an immense filip to Indian industry. There will be double stimulus. The great demand for industrial products created by the War will be the direct incentive to the existing industries while the difficulty of obtaining many of the articles, we are importing before will stimulate, the search for substitutes or ways and means of producing them here.

( a la contemporary “MADE IN INDIA” Call)
Sir Henry Craik ....contd.

- .. and in order to promote and coordinate and to facilitate the exploration of more fields of development the Central Government has just set up a Board of Scientific and Industrial Research on which a number of Scientists and Industrialists of this country have agreed to serve.

“Academic –Industry Partnership”
Dr Bhabha’s letter to Sir Sorab Saklatvala (1944)

I also hope that in time we shall receive liberal support from the Board of Scientific and Industrial Research whose avowed policy includes support of pure research.

It would be in the interest of efficiency if the Board of Scientific and Industrial Research decided to subsidise us to carry on pure research which is its intention to foster by paying us, say, ten percent of the annual expenditure it contemplates on the projected National Physical Laboratory.
N R Sarkar Committee Report (1946) on Higher Technical institutions in India

- Members: **SS Bhatnagar**, JC Ghosh (IISc), Nazir Ahmed, John sargent (Secretary Education), Dharam Vira, S. Sobha Singh, K Venkataraman (UDCT), etc. ... 

**PREMISE**

Due to post war reconstruction in Europe, Engineers and Technologists would not be available for India, New Technical Education and Research programme ought to be initiated in India at utmost speed and determination.
Highlights of the Proposal

- Four Technical institutes on the lines of MIT (USA) be initiated; one near Calcutta, one in Kanpur, one in Bombay, one in South. (first set up as IIT KGP in 1951 at the initiative of B C Ray, CM of Govt. of West Bengal)

- Original proposal called for 4-year Bachelor degree after class XII (10+2). PG classes were also envisaged.

- UG/PG students ratio was envisaged to be 2:1, students/teacher ratio was to be 10:1 for UG and 5:1 for PG.

- Estimated cost (1946) for creating an IIT was ~3 crores.

- Annual salary ~30 lakhs, Other recurring expense ~38 lakhs, Income from students (Rs 200 p.a. from 2000 UG) ~4 lakhs, Income from other charges ~2.5 lakhs, Income to be generated from infrastructure ~4 lakhs.
Changing Landscape of Education since 2000

• Conform to a Technologically Driven, Knowledge-Based Globalized Economic System

  Universities need to assume role of Entrepreneurial and Technology based Economic Development for their survival and sustenance

• Corporates need knowledge workers who are technologically savvy: Inculcating sense of Entrepreneurship

• ‘Corporate participation in Higher Education’
  N. R. Narayananmurthy Report (2012) is a possible answer for State funded Universities

  Public and Private partnerships in Universities in order to form a mutually synergistic model
3rd Generation Universities

Scientific Excellence

2nd Generation University as Science Center

1st Generation University as Intellectual Center

3rd Generation University as Generator of Science Innovation and Entrepreneurship

- entrepreneurship and innovation (applying science, relevance) as strategic objectives
- university/society interaction
- university as global network of excellence
- open innovation
- pro-active regional linkages: CRIKC
- engine of early-stage innovation

Adapted from A. Paasio 2010
CHANDIGARH REGION INNOVATION & KNOWLEDGE CLUSTER (CRIKC)

Established since 2013

http://crikc.puchd.ac.in

Participating Institutions

- Panjab University
- CIAB, Chandigarh
- IIT, Ropar
- GMCH, Chandigarh
- CSIO, Chandigarh
- CDAC, Mohali
- ISB, Chandigarh
- NITTR, Chandigarh
- IISER, Mohali
- IDC, Mohali
- PGIMER, Chandigarh
- NIPER, Mohali
- PEC, Chandigarh
- TBRL, Chandigarh
- CRRID, Chandigarh
- DIHAR, Chandigarh
- INST, Mohali
- IMTECH, Chandigarh
- NABI, Mohali
- SASE, Chandigarh

Feb. 19, 2015: CRIKC Buses Flagged off
Mar. 12, 2015: PU & UoN signed MoU

Australia-India Scientific Research Foundation

CRIKC Nano Science Day

March 22-28, 2016: 1st GIAN Workshop

Visit of Nobel Laureate Sir V. Ramakrishnan

August 30, 2014: Visit to Nottingham, UK
Sept. 09, 2015: National Teachers Day

August 30, 2014: Visit to Nottingham, UK
### Evolution of CRIKC

The idea of having knowledge cluster/hub has its genesis in the 'Narayan Murthy Report' April 2012, commissioned by Planning Commission on corporate participation in 'higher education'. This also finds echoed in the 'Knowledge Commission Report' of GOI. Further, the idea of having alliances between institutions of higher education and research, in and around a given city, also finds reference in the 12th Plan Document of Government of India. The idea of having knowledge cluster/hub is also inclusive of the 'Meta-University' concept, being advocated by MHRD, GOI in its RUSA document. Furthermore, 'Science, Technology and Innovative (STI) 2013 policy' of GOI also refers to clusters/hubs as tools for innovations. The Sam Pitroda report has also underlined the development of excellence in educational and research institutions facilitating innovation and knowledge cluster.

Keeping these broad ideas in mind, several rounds of meetings involving heads and/or their representatives have been held, involving institutions of higher education and research in and around Chandigarh. In one of the meetings held on 24th November 2012 at Panjab University, it was agreed to name the knowledge cluster/hub as Chandigarh Region Innovation and Knowledge Cluster (CRIKC). This idea has received support from the local MP, Shri Pawan Bansal, who has agreed to release funds to the tune of Rs. 1 crore out of MPLAD scheme to realize few steps towards its creation, the first installment of Rs. 37 Lakhs was received by Panjab University in March 2013.

### Mission Statement and Aims of CRIKC

CRIKC would endeavor to foster and sustain close academic alliances between institutions of higher education and research in the Chandigarh region, to facilitate innovation and knowledge creation and for achieving excellence in all academic spheres without compromising in any manner the autonomy of the participating institutions.

### Goals achieved during Phase I of CRIKC activities:

- CRIKC website with a directory of active Scientists in the Chandigarh region.
- Free shuttle service to cover institutions under CRIKC.
- Lecture notification amongst different institutions.
- Holding joint seminar/conferences.
- Sharing of library resources.
- Seamless access to the laboratory facilities of participating institutions.

### CRIKC future plans:

- Common identity cards and joint Ph.D. programs including common courses.
- Setting up of Centre for Theoretical Studies and Policy Planning .
- Creation of Research Based Sub-Clusters (Medical, Industrial, Nano-technology, Physical Sciences, Chemical Sciences, etc.)
- Create/provide facilities to attract faculty members from abroad to spend sabbatical leave period in CRIKC institutions.
- Initiation of Industry-Academia interaction
- Facility of spending a few months in the participating institutions on mutual basis
- Integration of Industry sponsored programs.
- Setting mission oriented goals.
- High level of visibility in research.
- New and innovative schemes to attract talent, in particular, Inspire Post Doctoral Fellows to choose CRIKC institutions as hosts to initiate new programmes.
- Creating examples where we achieve 'concept to commercialization'.
CRIKC ACTIVITIES: GOALS ACHIEVED AND FUTURE PLANS

Target activities of CRIKC:

- Joint PhD programs including common Pre-PhD courses
- Strengthening of entrepreneurship and startup ecosystem through an Industry-Academia Interaction
- Creation of Research Based Sub-Clusters (Medical, Industrial, Nano-technology, Physical Sciences, Chemical Sciences, etc.)
- Setting up of Centre for Theoretical Studies and Policy Planning
- Initiation of multidisciplinary research programs for societal benefits (Smart city, Solid waste management, etc.)
- Create/provide facilities to attract faculty members from abroad to spend sabbatical leave period in CRIKC institutions.
- Creation of infrastructure for international students, Inspire fellows and GIAN participants, etc. as an integrated facility to support all CRIKC institutions
- Innovative schemes to attract talent, in particular, Inspire Faculty and Post Doctoral Fellows to choose CRIKC institutions as hosts to initiate new programs.
SYNERGY BETWEEN CRIKC & CHANDIGARH UNION TERRITORY ADMINISTRATION

• The collaboration between CRIKC and UT administration has potential to put Chandigarh City in the league of Oxford, Cambridge (UK), Cambridge-Boston (US), etc.
• UT Chandigarh State Higher Education Council (SHEC), Chaired by Vice Chancellor, Panjab University and Co-Chaired by Director PEC has several Directors of CRIKC institutions as its members (IISER, IMTECH, etc.)
• British Council actively engaged to promote collaborations between British Universities and CRIKC institutions as well as UK City Councils and Chandigarh City Administration
• Australian Trade Commission, German Research Foundation as well as AIST, Japan and US Embassy have shown keen interest to work with CRIKC
• CRIKC can help Chandigarh to retain well trained skilled man power for promoting research, innovation and entrepreneurship to address local as well as national problems

Promotion of Skill Development Programs
• Skill Development Programs as defined under ‘Kaushal Vikas Yojana’ of GOI has over 50 short term courses catering to engineering, biology and IT sectors for graduate and post graduate students
• CRIKC institutions collectively have the necessary resources to realize nearly all Skill Development Programs. One of the CRIKC institutions already has a well established Center for the Skill Development in the area of Automobile Engineering.
• Additional two programs in the area of Clinical Research and Medical Representatives stand planned to be started soon, in collaboration with the Private Sector.
CRIKC aims to establish an Incubation Center to improve the percentage of skilled workforce with following focused agenda...

CRIKC Center for Science & Business Incubation.

In 2014, Panjab University on behalf of CRIKC signed a MoU with University of Nottingham (UoN) to promote joint research activities in all the spheres. UoN has well established ‘Hayden Green Institute for Incubation and Entrepreneurship’ on its campus. In this context, Panjab University is willing to learn from their experience to nucleate and nurture technology and knowledge-based enterprises by leveraging the scientific and engineering competencies of the CRIKC institutions.

The proposed CRIKC Incubation Center will be a technology business incubator specialized in technology startups, offering products and services exploiting scientific expertise in the areas of Materials, Chemicals and Biological Sciences & Engineering.

The Center will focus in the specific domain of healthcare, including drug discovery, specialty chemicals & nano-materials, process design and packaging, manufacturing of biomedical products and devices, Softwares and Services, such as, process design and simulation, research and technology management, consulting and IP management services.
CRIKC INCUBATION CENTER:
A NOVEL APPROACH

The Incubation Centers (IMTECH, NIPER, PU, IISER-Mohali and IIT-Ropar) and DST-Centre for Policy Research (PU) offers...

• Office and Lab space with high-end equipments
• Scale-up facilities and Technical support
• Centralized utilities for process development to help technologies mature and attain commercialization.
• Facilities offered to researchers with nascent ideas, who want to develop processes and commercialize their product/s, and also as an R&D base for companies to try new technologies.

In short, Incubation Centers of CRIKC as a lead entity for entrepreneurial culture would

• Foster Chandigarh Region Science & Technology through start up culture
• Act as accelerator to mentor and develop young potential innovators
• Provide financial assistance through well organized fellowships
• Act as an interface for interaction between the innovators and industry/institutions
• Plan & match startup capital requirements from public/private funding.
Aim: To develop a network of collaborators spanning developed countries and CRIKC research & innovation community to share expertise and develop new urban research agendas to help deliver a step change in making urban living attractive, inclusive and sustainable in Chandigarh Region and create a model for cities across INDIA.

The major objectives will be to forge a sustainable community of researchers to develop innovative, and locally-acceptable solutions to the challenges faced by Chandigarh region.

Workshops and Networking events would be organized to provide a forum where academics, industry, policy makers and communities can exchange ideas, identify problems and deliver solutions.

To promote an international network to foster mobility, develop capacity and engage established and early carrier researchers and to promote the skills to work globally and find solutions to problems of Chandigarh region.
Thank You