

INDUSTRY INSTITUTION INTERACTION : SOME LESSONS FROM THE BRITISH EFFORTS

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ABSTRACT

Countries and Institutions are grappling with the challenges faced by Higher Education. By knowing what others are doing in this respect, perhaps lessons can be drawn and implementable Action Plans developed. In this paper, the author, who was sponsored by British Council to participate in a Workshop on a related theme in U.K., cites British examples for reflection and possible implementation in India.

INTRODUCTION

1. The generally accepted goals of Higher Education Institutions (HEIs) are all regarding knowledge :
 - (a) Discovery - unearthing, to find out
 - (b) Transmission - dissemination;
 - (c) Application - use (and abuse reduction);
 - (d) Intergration - productive relationship.

Others have listed it as Education (dissemination in an intellectual sense), Training (dissemination in a skill-oriented sense), Research (search for knowledge), and Extension (application of knowledge to practical situations, covering consultancy as well).

2. The commonly perceived ills of HEIs are :
 - (a) Dissociated from the process of

"wealth formation" for society : the folly of knowledge for its own sake.

- (b) Financial difficulties in promoting qualitatively superior Higher Education : the rationalisation for compromises.
- (c) Ignoring of key segments in decisional processes : the ruse that autonomy is imperiled so as to maintain the status quo.

3. The ills with minor variations in type and intensity are the same all over the world.

4. The British effort has tried to match the ills with solutions in this manner:

- (a) Creation of industrial orientation in Education

1. by vocationalising and raising the status of vocational education.
2. by interacting with industries and user-organizations.

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- (b) Augmentation of funds
1. by encouraging industries and government to encourage need-based higher education (considering in country's competitive position, job opportunities, etc.)
 2. by developing enterprises within HEIs (including Science Parks, aided corporate forms, etc.)
 3. by building Inter-University consortia and linkages
- (c) Enabling key segments to benefit :
1. by organizing school level functions (activities, competitions, updates, counselling)
 2. by bringing in "employees" into academic/training programs
 3. by initiating and participating in socially useful community work
 4. by associating in administrative processes

As may be seen from the above, India, too, has experimented (or dabbled) with some of the above approaches in an adhoc, disjointed manner.

EXAMPLES

1. Department of Trade and Industry

Aims :

By encouraging academics to enable industries to invest productively in R & D

Schemes :

1. Links (for long term theme bringing together government, industry, and HEIs)
2. Technological Audit (data-basing on knowledge, skills, facilities)
3. Industrial liaison (linking of industrial strengths)

4. Training schemes (eg. Postgraduate training partnerships [academics and field managers participate], Teaching companies, Facilitating the sparing of academics to industry)

2. Training and Enterprise Council

Aims :

1. Established as Private Companies to encourage (i) economic growth, (ii) people development and (iii) competitive edge, through partnership with Business firms and HEIs so that new/growth companies could be productive and competitive - all by creating, supporting and sharing the success of a place.

Process :

1. Persuade everyone to spend on training, stimulate demand for life-long learning, encourage everyone to identify and pass on skills, and help businesses to grow profitably.
2. Focus on value for money in Education (local responses to identified market needs, persuasion that training pays, assistance to invest in skills development)
3. Developing Education - Industry links (Education - Business Partnerships, School compacts, Teacher/Manager, Placements, developing Young Enterprise in Schools, etc.)
4. Managed by Board of industry, academics, government. It funds those who work for its aims (institutions, trusts, training organizations)
5. Attempts (a) to meet employer/individual needs (as against traditional focus of HEIs), (b) to raise the status of Higher Education (that is beyond degree-hunting), and (c)

to aid need-fulfilment through work-related further education.

6. Assists in Information (SWOT), Startup, Skills, Seminar, Business information, Creating business awareness, Preparing training (and self-taught) booklets, Capabilities development (language, law, skills, attitude, etc.) and guiding adults on skills-choice.

(Many of the long-term goals of TECs have been accomplished : New activities, improved businesses, standards attained, rise in quality of work-life, spread of topics, repeat and request for additional locations for TECs. TECs, dependent on government funds, have to sustain their credibility through transparency, fairness and Interaction with HEIs.)

3. Directorate of Teaching Companies

Aims :

To increase wealth creation and the competitive strength of the country through HEI - Industry links in areas such as Technology Transfer, Industry - based Training and Academic Research.

Process :

1. Funds sourcing from Central bodies of government, ministries, departments, industries.
2. Taking up of Strategic/Innovative themes (eg. TQM, Competition Handling, Cost Control, etc.)
3. Associateship positions for students (industry pays salary, HEIs and Industry monitor, local management participates)
4. Enabling HEIs to spare academic time for training/visits, and local management to guide/feedback.
5. Industrial issues are taken as stu-

dent projects and industry is charged.

4. University Science Parks :

Aims :

By locating in Universities and using its interactual benefits to develop hitech industry, defend economy, employ and retain people, generate income, transfer technology, provide business training, link HEIs and improve image.

Process :

1. By Co-operation with local authorities an landscaping, Venue for industry, Academic to be industry, Conference Centre, etc.
2. Avoiding the causes for Failure of Science Parks elsewhere including those abroad (like Technopoles of France and Technadromes of Germany)
3. Birmingham's Experience : (a) As there was no land, tieup with Municipality and State government, (b) Corporate strategy for University, (c) Chair for Entrepreneurship in Science Park (d) Convention Centre (Seminar, Exhibition, Sports), (e) Pretty buildings (with Lloyds Finance's help).
4. Surray's Experience : (a) Incubation for Rapid growth/high tech/changing /Maturing firms, Subcontracting, R & D Offices for large firms, Contract Research Organizations, (b) Planning Team (Town Planners, Landscapists, Architects, Engineers, Managerial Advisors, Public Relations Officer) prepares the place, handles the finances (equity, loan, grant, joint venture, profit, etc.) and administers such as tenant selection and contracts, technology transfer

(licensing, consultancy, student - employment, publishing).

5. Cambridge's Experience : (a) Commenced with 3 student in the sixties, attracted industries (at the rate of 2 per week in the early 80's) caused University spinoff firms (like Laser Scan) and New departments (like Industrial Engineering) to come up, Gained Media interest, Saw success/failure/takeover's and has now stabilised with professional expertise in general and specific areas; (b) Established Innovation Centre in 1987 (created by HEI but managed as a Company with rooms, facilities including address/desk/room based renting).

6. Portsmouth's Experience : (a) Established as University of Portsmouth Enterprises Limited (UPEL) offers facilities (like Building Complex, and Services (including assistance, consultancy and facilitation in areas like borrowings, debt collection, insurance, pricing, negotiating, business planning, intellectual property, etc.) for a fee which, after expenses, is shared between UPEL, University, and Faculty; (b) It is organized and operated by a small, administrative profit oriented group of University participants

(The earliest Industrial Park was established in 1951 at Stanford, USA, when Hewlett Packard anchored it with lease, funds, and contacts. UK has learned from it and others. The 52, in UK today, generate considerable funds for HEIs.)

5. Portsmouth University :

Aims :

To promote superior technology for

competitive advantage.

Process :

1. European Strategic Program of R&D in Industrial Technology (ESPRIT), a consortium of countries and organizations, working on several aspects to gain ISO certification for all areas.
2. Automotive research initiated with Rolls Royce support, now with UPEC contracted businesses.
3. Key Features : Software development, interdisciplinary, diverse industries, student-teacher teams, routing through UPEL.

6. Southampton University

Aims :

To promote industrial linkages for synergetic benefit to the University and its stakeholders.

Process:

1. Departments take up crucial local problems (like Shipping industry's, Biotech, Remote sensing for marine work, Coastal studies for local authorities, Fabrication of instruments, Waste-reuse, etc. - as the University is in the coast).
2. SATRO (Science And Technology Regional Organizations) covering 80% of UK, modelled on the Southampton Science & Technology Forum, Tries to excite the youth about these issues by introducing courses, Organizing Technology Fairs (ideas and answers), Counselling, and Offering Summer Schools for teacher updates.
3. Automotive Design Advisory Unit, a Profit Centre, Conducts simulated studies for consultancy.

4. James Russel Centre, Deaken Labs, with University partnership, makes Oceanography - related studies.
5. Science Park : leased to firms for 5 years.
6. Companies established by University (by borrowings, venture capital, company form to reduce risk to University) : Chilworth Science Park, Chilworth Manor, European Economic Interest Grouping (to market HEIs to industry).
7. Faculty is encouraged to start firms.
8. Office of Industrial Affairs which monitors, evaluates and rewards, provides paid for consultancy arranges Industrial Meets and Industrial awareness exercises, and helps research, patenting and managing.

7. British Technology Group

Aims :

This 4-decade old institution, in company form since 1992, helps technology transfer to industry by assessing, negotiating, licensing and protecting.

Process :

1. Assessment of Application, Benefits, Marketability, Special attributes (USP), Protectability, etc.
2. Negotiates on options, to protect items excluded, countries covered, down-payments royalty, sublicensing rights litigation, renegotiations, etc.
3. Offers patent agents/inventors lists, advises on patenting and bears the expenses, and shares benefits thereafter.
4. Ways used include Training, Publications, Personnel mobility, Consultancy, contract R & D, Sale/

Purchase etc.

a. Science & Engineering Research Council

Aims :

Funding of civil research for Topics, Post Graduate Training, Equipment/Facilities, and Dissemination by Transfer of Technology/Training/People.

Process :

1. Types covered include Fundamental (curiosity-driven), Strategic/Generic (applicable years hence), Specific/Applied (problem solving) and Technical Development (systems, products, processes).
2. Technology transfer by identifying training needs, Exchanging people between Education and Research, Collaborative research with industry, etc.
3. Support Technology transfer by catalysing users and providing links, Establishing interdisciplinary research centres /Disciplinewise Directorates, support initiatives/special/LINKS programs, etc.
4. Training and people transfer through Teacher-Industry exchanges/collaborations, Post graduate training partnership, Industry - based Teaching companies, Industry-provided projects/training, Integrated Graduate Development Schemes (which are modular, HEI programs with emphasis on industry-oriented course and project work), and Engineering Doctorates (with joint projects, industrial stipend, limited taught component (law, technology, language, management), and industrial/HEI labs in use).

9. International Business Machines

Aims :

To assist HEIs to move from pure disciplines to market - relevant ones and to avoid academic obsolescence.

Process :

1. Industrial training (sandwich) for students.
2. Graduate recruitment of "high fliers" groomed for key positions
3. Joint projects
4. Working for Awards
5. Sponsored students for training
6. Educational links (for courses, even accreditation, Modular Master's courses)
7. Open Learning Centre (using multimedia, Interactive videos etc.)
8. School links (with many schools/colleges in scheme, teachers/students spend 2 weeks at a time at IBM, and IBM staff lecture at Schools/Colleges).

10. Corporate Experiences

- (a) *FRICTEC Ltd.* which has 4 patents worldwide links with industry to *Recruit, Teach, Consult* (Translation, Analysis), *Educate* (part time courses for employees) and *Research* (joint efforts to design and indigenise)
- (b) *Prosing Computer Consultants* view that only those teachers would succeed who can visualise mechanisms to use industry in a systematic way, who are ready to face challenges by realising corporate realities, and prepare themselves.

[The corporate world suggests that (i) one should begin with, slow changing and low-cost industries so that initial

shocks are less, and (ii) one should quickly commercialise an idea.]

So far the many efforts initiated by UK - to make Education relevant, attractive, and cost effective - have been listed. What generalisations and lessons can be drawn ?

GENERALISATIONS

1. The purpose of Higher Education should be to improve the life-opportunities for the student and its activities should encompass the improvement of Quality of Life at all levels at work and at rest.
2. New approaches are needed because of the Increasing challenges of competition, Financial crunches, Unemployment, Business collapses, and Failure of preconceived centralised government prescriptions. (For example, as even the qualified degree holders of HEIs become quickly dated and as it becomes necessary from them to move soon from a pure to market - relevant disciplines, Industry can help in overcoming these ills.
3. HEIs have local/state/national/international roles to play, going beyond knowledge and towards community-responsive activities so that they could justify their existence as socially relevant institution.
4. Role of HEIs
 - (a) Creating and preserving an academic image
 - (b) Participation in the positive restructuring of socioeconomic framework.

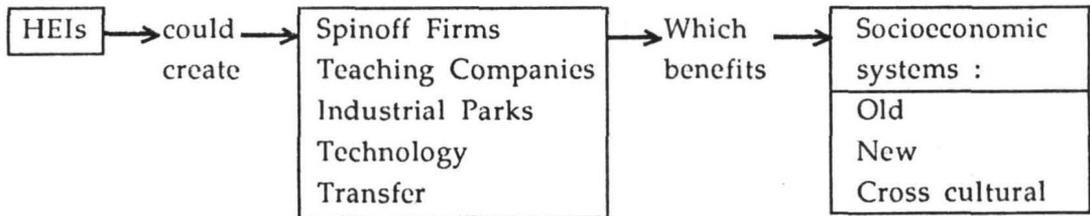
It follows that (a) knowledge must be commercialised for wealth cre-

ation and (b) HEIs which are not participating in this process would fail in the long run.

5. As HEIs generate knowledge and some of it is tradable, they should try to benefit from the knowledge by commercialising it.
6. As innovation is not linear (since it could be at any stage) and academics often follow invention by others, systematizing through linkages is necessary for spinoff, competition and progress.
7. Industrial linkages have helped
 - (a) Establish Universities like Reddin (Biscuit), Southampton (Wine), and Bristol (Tobacco).
 - (b) HEIs to develop new research areas/projects, pedagogic improvement and

illustrations, equipment acquisition, social and industrial problem-solving, reoriented priorities, and justification for their existence.

- (c) Industries to improve their performance by getting problems solved, superior job, specific recruits, participating in interdisciplinary growth, and motivating its staff to enhance their credentials.
8. Studies in U.K. show that industries consider HEI-linkages to be beneficial, they seek complex areas for linkages and linkage-based students for higher scales of pay, and feel that career development, too, is gained thereby.
9. If the main goal of HEIs is seen to be economic development, then the following picture emerges :



10. HEIs should exploit : (a) their strengths - ideas, stake - holders, and interacting systems, (b) the opportunity to overcome the drugery of routine, and (c) the scope to overcome public doubts about the social cost-benefit of HEIs.
11. Despite the understanding and the steps initiated, things go wrong because plans are unrealistic, pro-

moted by passing-by academics and because of indifference, initial failure, unaided efforts, high expectations, "reinventing the wheel" mistakes, delays, frustrations, and culture gaps in industry teachers risk their Security, Pay, Pension, Promotion, etc. and have to face unfamiliar problems of Law, Competition, Taxes, Management and Deadlines !

Based on the generalisations, what lessons can we draw ?

LESSONS

1. Provide a professional and constantly updated orientation to *all* courses, integrating pure disciplines into the fold.
2. Determine the balance between Education and Training (that is between Knowledge and Skills), and gravitate towards the latter.
3. Symbiotically network all HEIs in terms of their attributes and possible synergistic contributions.
4. Seek help from the end users (the employers), students, and alumni.
5. Form a Task Force comprising HEI and Industry to (a) study industrial requirements, (b) identify cost-effective areas for interaction, (c) provide key resources for mutual benefit.
6. Instead of expecting and waiting for industry to show interest (as is done by government), take the initiative to draw industries into the process.
7. Seek help from Bankers/Management Clubs, Business Forums, etc. to obtain ideas and help for activities/funds/placements.
8. Encourage Faculty to commence businesses, and/or gain industrial exposure through suitable sabbatical leave rules.
9. Establish Business/Technology Parks. National S & T Entrepreneurship Development Board (NSTEDB) of our DST had developed 12 Science & Technology Entrepreneurs Parks (STEP) of which only 4 --- BIT - STEP (Ranchi), TREC-STEP (Tiruchi), STC-STEP (Mysore), and JNE Chemical Park (Bimbay) - have succeeded. Such parks, therefore, should be (i) tailored to local needs/situations/changes, (ii) more than real estate management outfits, (iii) nurturable concepts (and not for adhoc, uick fixes), (iv) involving competent and motivated students/teachers/administrators, (v) able to handle volatile firms carefully, (vi) seeking ideas from all sources, (vii) shorn of bureaucratic features that stifle. Perhaps, it would be better to gradually move from Entrepreneurship Courses to a Centre to a Park.
10. Establish a company form for growth and diversification activities of HEIs so that professionalism, profit centering, flexibility and other benefits could be reaped --- especially as these are not accepted to be the main tasks of HEIs.
11. Courses could be professionalised by making them (i) suit current/future needs/aspirations/careers, (ii) modular and part time, (iii) industry promoted (in sponsoring, contents, pedagogy, evaluation), (iv) local credit - earning even at the places of work, (v) include useful inputs (on law, entrepreneurial procedures, trouble-shooting, management etc.) in addition to technology,, and (vi) administered by a committee comprising staff from HEIs and Industries.
12. As the teachers entering business are likely to lose their sense of Security, they must (i) develop their stress managing skills, (ii) explore problem areas, (iii) focus on Marketing, (iv) create condusive environment, (v) begin with students,

(vi) encourage vertical/lateral thinking skills, (vii) create synergising opportunities. These should be "brainstormed" at Entrepreneurship Workshops.

13. School - level activities -- like HEI-Day for children to visit/know, refresher courses for teachers, counselling organizing of brain - stretching competitions --- are necessary if inputs of HEIs, are to be good. Catch them young in action, as it were.
14. HEIs, in coordination with other organizations, should prove their social credentials - working on programs relating to health, nutrition, sanitation legal awareness, civic sense, job-skills etc. -- with a commitment beyond that of NSS/NCC statistics
15. HEIs should develop (a) Quality Improvement Teams, (b) Innovation Centre, (c) Industry mentoring, (d) Empowerment, (e) Bureaucracy busting (to cut redtape, to seek short cuts), (f) teacher-leader cum linking personnel (IBM even trains persons to be moles -- to find out the "reality" of meetings !)
16. It requires (a) Crucial themes to work on, (b) Superior qualities in all 6 partners -- Industry, HEI, Government, Society, Faculty, and Student, (c) Champions to promote the various ideas and schemes.
17. Industry looks at interacting with HEIs
 - (a) as social participation by donating and tolerating and
 - (b) as a source for its improvement only if the interaction were to be

profitable, market-advantageous, reliable, opportunity-offering, and to be the best deal available.

HEIs have to decide whether they wish to be recipients or partners.

CONCLUSION

1. Institution - Industry interfacing is necessary in view of the challenges faced by society, HEIs and Industry, call for symbiotic and synergetic efforts.
2. The benefits would be in terms of better resource use, superior output, improved R & D enhanced educational offerings, thereby raising the status of the institution and the nation.
3. The activities that could be explored include Teacher /Manager exchanges, Resource sharing, Development of staff/student/Industry/Curricula, Collaborative R & D, Information exchanges, Sponsored training/research, Business Parks, School-level familiarisation, and Community involvement.
4. Success of the effort depends on Transparent, Clear, coordinated approach and Qualities of competence, Confidence, Curiosity, Courage, and Commitment among the participants.

HEIs have a choice : to interact or to perish. If the latter, then our hands would be tainted as we would have caused its death.

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