RESEARCH MANAGEMENT

Öktem Vardar,
EUA, Induction Seminar, Leuven, 4.10.2003

I. GENERAL PRACTICES, TRENDS

Research management is a current and somewhat controversial issue, which can be conceived at four different levels
- institutional level
- external (funding agency) level
- national level
- international level

I will elaborate on the first, management of university research. Before going into the details one may pose two vital questions:

Can research be managed ?

Can anything generic be said ?

My answer to both questions will be "yes"; and the intensity of "yes" will depend on the type of institution and the prevailing external conditions.

As the 1995 enquiry on university research, conducted by CRE[1], shows there are two extremes in the understanding of research among European universities:

(1) bottom-up approach – "research is the responsibility of individual researchers"

(2) top-down approach – "research activities are a service rendered to the community and as such, fall into families of projects that can be prioritized in function of external interests".

The bottom up approach is input oriented, usually called "laissez – faire" model (let it be model) whereas the top down approach is output oriented and corresponds to the management view (mission-oriented, targeted model).

Most real cases are some combinations of the two pure modes. Even the "laissez – faire" institutions are, for example, observed adopting some kind of steering, gradually, towards innovation planning.

The dichotomy may be extended by asking judicious questions such as:

How to allocate to make the most out of the available funds? Spread evenly for most satisfaction OR match incoming funding only?

---

[1] CRE, Summary of 1995 Enquiry on University Research, Geneva, Nov. 1995

What is the profile of the research manager? Low-key facilitator, at the service of faculty, for a limited time <u>OR</u> active manager guiding research policies, strategies and steering the system?

What is the mechanism of support for research? Slush funds at the discretion of research manager, providing speed and flexibility OR bureaucratic channels through committees with well known procedures, providing absolute fairness?

The legitimacy of central involvements in research management is basically the external demands on universities to demonstrate research performance. The central involvement is perceived in certain universities with caution; it is seen as a threat to scholarship and freedom of inquiry. As the sources of research funding have shifted from an overwhelming dependence on core funding towards reliance on a much wider range of bodies allocating support on a competitive basis and for specific projects, the need of managing research has become unavoidable. Even developing countries are adopting the practice with the hope of providing incentives, guidance and making best use of the opportunities available. This is particularly true for the enrichment of flagship universities, as the awarding of special status to a limited number of higher education institutions is a widely recognized strategy.

Several closely inter-related factors in the external environment are responsible for the emerging institution wide research management: Changing funding regimes; new societal demands on universities and university systems; changes in the practice of innovation and research, requiring close ties between universities, industry, commerce, government and community, but also the realization that research is the basis of wealth creation and deserves close care. The current trends and specifics of research management have been discussed in two consecutive OECD meetings in Paris, in the year 2000 and in Tokyo in 2001 with broad input from various countries. A few highlights from these meetings are presented in the following to describe the current situation[2].

While all universities strongly maintain a core function of teaching, the same does not hold for research. And the levels of research engagement vary widely even within individual national systems. The motivation for individual academic researchers may also change from intellectual challenge to recognition by the peer group or recognition by academic institutions (promotion), to the pride of being part of an innovation/ original product, process. While much emphasis is put on

---

[2] Helen Connell, OECD/IMHE meeting: University Research Management, Tokyo, Febr.2001

multidisciplinary research and team work in various areas, particularly when there is need for expensive laboratories and equipment, there are still areas of the sciences, the humanities, social sciences where research is an individual pursuit, not dependent on expensive external support.

Emerging trends seem to affect the whole structure of research activities. National research funding policies emphasize economic growth through science. Base funding of public universities is reducing and being replaced increasingly by performance–based and competitive allocation processes. A number of countries started injecting significant new public funds into higher education research to boost national competitive capacity in the knowledge economy. Economic and social benefits, among others, dictate the spread of such funds. The trend towards funding for specified research activities is not new in the United States, where earmarked research is well established, but it is new in much of Europe.

As to the university–industry research relationship, contacts between universities and large firms are based on a complementary model and are well established without major problems. Industry is wealthier; there is more interest for high technology activities from financial markets. Entrepreneurial researchers exploiting their research or university–small firm relationships may cause greater complexities (firms lacking cash to pay faculty, offer equity; thus faculty relationship tend to be more intense with a built-in conflict of interest); despite these difficulties universities widely continue to encourage start-ups and spin-offs as the key and most effective means of commercializing university discoveries.

The role of universities in research (as opposed to research centers, and government laboratories) is not decreasing; similarly interest in long term basic research. But social sciences, especially in their links to natural sciences, are more emphasized and public funds go increasingly to educational structures, towards a learning society. Universities carefully seek out their comparative advantage and build on their strengths rather than trying to do everything. Growth of performance-based funding by external agencies means that a growing proportion of universities' base funding has become dependent on achieving defined outcomes. Established groups, thus, have a much better chances than late-comers. Not only the external market conditions but desire to increase institutional autonomy through diversification of funding also invites direct financing by third parties (such as industry and private foundations). Out of balance share of third party funding can easily lead resources to shift towards activities where commercial possibilities are greatest. Thus, traditional

curiosity driven research may be endangered by short-term contract research (unless some central authority protects long-term public interest).

To respond to these emerging priorities, to manage the increased funds and to deliver on the heightened expectations **improved institutional management** is seen as an important element in the successful functioning of national science systems. Formalizing central, university-wide research manager or chief research officer (CRO) is of relatively recent origin for most universities. Major tasks include: establishing an environment conducive to research; establishing institution-wide priorities and plans for research; seeking and allocating resources for research; costing research; help identifying focus areas, priorities, suitable niches but at the same time protecting flexibility; setting and maintaining quality standards by supporting internal and external assessments; emphasizing partnership, collaborations, strategic alliances; informing staff about the policies and priorities of external research funding agencies, attracting to the university outstanding and entrepreneurial researchers; developing an ethical framework to protect the integrity of institutional research ; providing for intellectual property and legal issues; planning for and managing the staff research career.

II. STRATEGIC RESEARCH PLAN

The trend in public universities in many countries toward increased autonomy, greater freedom to define their own priorities and allocate their resources provides a considerable challenge for institutional management – it opens up more options, and also contains more risks. It is believed that institutions will formulate research priorities and plans, which build on institutional strength and engage productively with their local regions. They are expected to be more sensitive to requirements external to them.

Given the trends summarized above, each institution will choose its own line of action through its strategic plan. The strategic research plan should be an integral part of the overarching plan and should outline how institutional commitment to research will be realized in the near future. The CRO or the rector him/herself should lead the way to formulate the body of the strategic research plan; without a decisive leader it is highly improbable to mature such a document nor is it possible to operationalize it. Departments' and researcher's active participation is absolutely necessary to internalize it; involvement in the process and achievement of

effective communication are prerequisites. In the words of Burton Clark, the steering core should take all initiatives to make the academic heartland to produce a strategic plan along the policies of the steering core. An action plan has to be provided for each item with available resources, timing and key performance indicators. It should include institutional preferences, niches to exploit, funding mechanisms, interfaces with external bodies, evaluation mechanisms, the issue of research training/research career. That mode II research is picking up and partially replacing discipline based Mode I research needs to be addressed together with non-traditional outputs (as apposed to publications in refereed journals), which include solutions to real problems, consultancy reports, establishing spin offs, etc.

It is not unusual that funding agencies ask for the institutional research strategy before they consider an application for research funds. Canada Foundation for Innovation (CFI), for example, insists to receive research strategic plan of the university endorsed by the vice-rector for research along with any proposal.

Graduate programs (especially PhD) are intimately related to research. Research education is still coincident with training for academic profession and contains significant differences between countries and between disciplines. Strategic research plan is expected to address particular issues of research education in that institution. Typically, funding base of doctoral education ought to be covered (doctoral students may be part of a project/ team, may participate in contract research, have support through research institutes or industrial sponsorship or work part-time). High cost of equipment, non-completion rates or low completion rates, connections between university research and the national innovation system, expansion of research (systematic inquiry) even to undergraduates may be others in the list.

Research career and associated complexities need to be studied, policies developed and internalized. Mass higher education and explosive growth of knowledge brought certain tensions to research career: 'The teaching of first year students and of doctoral and postdoctoral students becomes two contrasting ends of a lengthening sequence'[3]. While some academics enthusiastically embrace the idea that they can simultaneously contribute to the advancement of disciplinary knowledge and to emerging technologies, many are devoted to their collaborations outside academia[4]. Similarly, market driven research related issues of competition, secrecy,

---

[3] Burton R. Clark , Journal of Higher Education,68,3 , p.241, 1997
[4] Mary Henkel, OECD/IMHE meeting: University Research Management,Paris, June 2000

collaboration and academic virtues of free communication, public good have to be resolved, at least for the institution, to give the researcher a peace of mind.

III. KEY ELEMENTS OF RESEARCH MANAGEMENT

A recipe is prepared in the following with the hope of clarifying the job description of a prospective CRO. The post should certainly have power to lead, but the basic idea is to act as a catalyst and apply supportive pressure to improve research potential; it is a bit decision making, a bit convincing. It may even involve providing counseling to faculty research leaders. Publishing paper is a means and not an end by itself, as we all know. Thus, CRO should be responsible for **developing expertise** and using it to improve **the quality of life**. He/ she is expected to be transparent and accountable to the rector as well as faculty. Periodic evaluation of the CRO by the stakeholders may be a proper way to achieve this.

Institutional settings will vary drastically among universities, which may render some of the items below meaningless. Nevertheless, if we could complete this list as much as possible it would guide both the self-evaluation processes and the evaluation visits.

A set of questions complementing the list is included in the annex.

1. Establish an environment conducive to research
    1.1. Have enough time for research i.e. reasonable teaching load, service load
    1.2. Create a working atmosphere (living research atmosphere) ...you are not alone; everybody is in the same ship – discussion groups, chat sessions, seminars, conferences, lectures,…
    1.3. Have enough incentives to do research and not something else
    1.4. Develop an ethical framework to protect the integrity of institutional research
    1.5. Provide for intellectual property and legal issues
    1.6. Establish effective bridges of cooperation between university and private, public sectors

2. Provide for the needs
    2.1. Provide for necessary space, time, flexibility
    2.2. Seek and allocate resources for research
    2.3. Have funding avenues clearly defined and documented

2.4. Provide reasonable support for mobility to visit colleagues, labs, libraries; to attend conferences...

2.5. Provide support to engage in collaboration with industry

2.6. Provide information and guidance for external funding sources, possibilities

2.7. Give moral support and priority to active researchers and their problems

2.8. Plan for and manage the staff research career.

2.9. Promote renewal of research interests (for scientists in outdated research areas)

3. Define clearly short-term and long term objectives--link to institutional values

3.1. Institution must have over-arching strategic plans. In line with this, help to develop research policies and strategies for the university and the individual units.

3.2. Establish institutional niches and institution-wide priorities

3.3. Help identifying focus areas, but at the same time protecting flexibility

3.4. Develop a set of performance indicators

3.5. Emphasize partnership, collaborations, strategic alliances

3.6. Address the issue of Research Management, to arrive at the core functions of the office and the degree of coordination expected from the office

4. Set and maintain quality standards; monitor performance

4.1. Monitor student quality and quantity feeding research activities

4.2. Assess human, physical and financial resources

4.3. Have a systematic internal assessment of research outcomes & outputs[5] –measure both quality and quantity of research.

4.4. Provide for external assessment for national or international visibility; benchmark with comparable institutions.

4.5. Develop research management information system, to follow performance in the priority areas among others.

5. Evaluate and take corrective action

5.1. Create platforms to interpret/digest evidence to internalize further action

5.2. Check how well performance leads to objectives

5.3. Identify sore spots, shortcomings; formulate pathways to improvement

---

[5] outputs: publications, conference presentations,.. ;
outcomes: designs, software developments, degrees conferred, innovations,…

5.4. Assess the possibilities of cross-fertilization

5.5. Aim at sustainability

5.6. Attract to the university outstanding and entrepreneurial researchers

IV. USUAL OBSTACLES / RECOMMENDATIONS

Major factors contributing to success in research management can be formulated as:

Identification of research potential in the institution, research awareness in the region, research need in the markets.

Finding a believer in research management who is ready to serve as well as to lead.

Establishing clear and shared links between the overarching institutional plan and the strategic research plan.

Quality Culture Project was instrumental to evaluate the research management climate in seven different universities/ countries. The obstacles identified, in the order of importance, are reported below. A few recommendations are attached to each problem area. Obviously, neither the obstacles, nor the recommandations are exhaustive. The goal is to note the common shortcomings so that solutions can be compiled by common efforts or imitation of the successful.

1. Insufficient degree of awareness within the academic community for matters concerning research management and quality management in research:

- Central office for quality assurance (possibly under the supervision of one of the vice-rectors) can be established to assume ownership. Sessions may be devoted to this topic in the Senate, academic councils, department meetings etc. to assess / brainstorm the issues.
- Specific procedures related to quality monitoring should be installed and promoted.
- EUA may provide supporting action through publications, seminars, disseminating information on best practices in European universities.

2. Lack of policy to introduce good management practices, lack of appropriate funding:

- Open the university to external assessment. Provide for transparency.

- EUA, in collaboration with OECD/ IMHE, offers management seminars to university top management. Next one is in Ireland, on April 16-21, 2004.
- Project funding should be tied to the research performance to create some motivation.
- Funds for research management may be generated through overheads taken from projects / donations.
- Develop a system where positions are occupied by persons with proper competencies.

3. Lack of a shared vision and strategy:
- Have institutional vision, mission and strategic plan. Unless these plans are shared and internalized they are useless documents and won't provide guidance to the institution. Thus, develop mechanisms to iterate to get all contributions, to discuss and to digest. In all these processes top management must show commitment, active ownership of the plan and repeatedly explain the general philosophy as well as the details.
- Improve the channels of communication and allow feedback.
- Transfuse strategy into day to day business.

4. Teaching dominant:
- Award credit for research achievements. Shift teaching oriented incentives to research or, at least, use some part of it for research (tax extra teaching pay to subsidize research).
- Allow in daily activities a balanced time for issues related to research (if one department meeting covers all teaching issues, arrange the next to discuss only research related issues.).
- Choose/promote administrators who value research, who are committed to the priority of research.
- Arrange seminars/discussions, conferences, meetings, invited lectures to create an environment valuing research.

(It is ironic that research is widely regarded as the most powerful driver of reputation and risks distorting institutional behavior. The balance between teaching and research is a delicate one and needs fine tuning for each institutional environment separately.)

5. Insufficient emphasis given to accountability to stakeholder:
- Universities are liable to society. Promote the idea that, at least part of research, must be towards economic and social benefit.
- Balance "laissez-faire" attitude with "managerial" tools.
- Establish schemes for internal evaluation / external evaluation.

6. Lack of research evaluation procedures / tools:
- Benchmark with other (comparable) institutions.
- Start self-evaluation reports / annual activity reports…
- Self-evaluation processes are best if accompanied by site-visits by panels with international membership.

7. Insufficient interdisciplinary / multidisciplinary research (structure and methodology):
- Joint supervision of MS and PhD theses.
- Common seminars where experience / projects/ specialties are shared, common or complementary features are searched.
- Incentives, extra funding for joint projects/research.
- Promote mode II, problem-based research.

8. Lack of research incentives on individual level:
- Award credit for research achievements.
- Encourage to establish research groups, centers,…
- Recognize excellence.
- Provide for extra services to young researchers, such as housing or kindergarten.
- Encourage sabbatical leaves to concentrate on research activities.
- Provide for travel support / mobility of researchers.

9. Lack of proper size and quality:
- Monitor the graduate students quality and quantity as a vital component feeding in the research activities.
- Leading edge research is growing in complexity, scale and cost, requiring cooperation. If cooperation within the institution is not feasible, have external links.

10. Lack of experience acquiring international project standards and insufficient funding of research:
- Interface with external bodies may be missing. Strengthen research management.
- Promote participation to ERA.
- Promote mobility.
- Educate academia to meet the proposal requirements of EU.

11. Deficiency in university-industry cooperation, transfer of research results to society:

- Campaign towards recognition of the service to society as the third function of the university.
- Develop interface agencies promoting links between university and industry.
- It is possible that critical mass is not reached; there may be insufficient manpower to emphasize both teaching and research and community service. Thus, increase academic staff size.
- Identify focus areas, strengths in research to transfer it to the industry.
- Promote R&D subsidy by the government.

12. Lack of incentives for spin-offs and technology transfer:
- With the support of the government, local government, industry, and universities create units for technology transfer, knowledge transfer, spin-offs, incubators, science and technology parks.
- Create activities for the support of the promising results from research and development by the venture capital.
- Help to develop entrepreneurial attitude – desire to create discretionary funds (ask people read Burton Clark's book on entrepreneurial universities, for example.).

13. Insufficient emphasis on intellectual property rights (patents and royalties):
- Give guidance to researchers on ethical issues (both limits to scientific research and the integrity of institutional research), on IP and legal issues by qualified personnel under the supervision of a committee (or officer) on ethics.
- Provide assistance and financial support to researchers for issuing patents and participating in the revenues of patents and royalties.
- Have "clear and contractual set of statements in respect of IPR, setting out the rights of the university and the individual".
- Introduce undergraduate courses like Science Ethics/ Professional Ethics into the curricula.

ANNEX
Set of questions to assess the existing structures/culture in a university (some overlapping or repetitive, rephrased to catch a different perspective if possible):

1. Does the Institution have over-arching strategic plans? Difficulties arising? Discuss the value and usefulness of such plans.

2. How are research goals established? What are the strategic choices as far as research is concerned?

3. Address the issue of institution-wide coordinated research policies and strategies as against a laissez-faire attitude, leaving a free hand for individual departments and research units

4. If institution-wide (top-down) policies prevail: How do you formulate priorities; attract and allocate resources; evaluate research quality and research capacity; establish a productive relationship between the processes of institutional management of research activity and institutional government?

5. If laissez-faire attitude prevails: What are the key problems and issues emerging as part of this policy. How to interface with external bodies; introduce incentives to gather around "priority" areas (that of research communities, country, region or institution); evaluate research quality and research capacity

6. Does the institution have a central office/ an individual responsible for the management of research? Who does the head of the office report to? How long has the office been established and what is the number of staff in the office?

7. What are the core functions of the office described above within the institution:

     grants/contracts negotiation and approval
     industrial liaison
     intellectual property rights
     donations and fundraising
     short courses
     financial management of awards
     allocation of internal funds
     commercialization/dissemination of research findings

      ethical clearance
      research performance appraisal
      research policies and strategies

8. How does the institution address the question of balance between its teaching, research and community missions?

9. What are different ways of fostering an environment conducive to research? What are the processes through which policies and strategies have been achieved?

10. What are ways in which research groups are structured?

11. What are university-industry research relationships? Structures, complexities..

12. How does the institution balance between flexibility and exploitation of suitable niches?

13. How are the ethical issues (limits to scientific research/ the integrity of institutional research), intellectual property (IP) and legal issues handled by the institution?

14. What is the environment in which the institution operates? Pressures to achieve research concentration both within the institution and externally?

15. How is the tie between research career and teaching career evolving? What are the personnel policies for recruitment and career development as researchers and support staff?

16. What are the funding policies of the institution? How do they compare with or complement performance based and competitive allocation of national funds and/or high cost, international leading edge research?

17. How are the conflicting claims and interests of individuals, teams, departments resolved or managed? Any policies, regulations developed?

18. How is the graduate student quality and quantity monitored as a vital component feeding in the research activities?

19. How are the human-, physical-, financial-resources assessed systematically?

20. Are research outcomes and outputs systematically evaluated, both internally (in the light of institutional strategic research planning) and externally (for international visibility)?

21. How is credit for achievements awarded?

22. What are the platforms to evaluate evidence and make judgments about measured performance?

23. What are the mechanisms to assess the possibilities of cross-fertilization?

24. Are there any centrally held databases of the following:
 university expertise
 funding opportunities
 potential client organizations

25. Does the institution monitor the number of externally funded research contracts engaged per year (say, over the last three years)?

26. What is the estimate of the percentage of the externally funded project research from the following sources:
 international philanthropic foundations (e.g. Rockefeller/Ford)
 international agencies (e.g. UN,UNESCO,EC)
 national foundations/trusts/charities
 national government sources (e.g. central/local government, research councils)
 private sector

27. Is there any specific support within the institution for proposal writing? If yes, is it regarding technical compliance (meeting requirements of sponsor/ institution)
 contractual/ legal compliance
 costing and pricing
 presentation
 ethics