

Report of the
Ad Hoc Committee on
The Research Development Council and Overhead Return
(Moser, Peura, Sokal)
13 May 1986

Motion

The committee recommends, and moves, that the WPI Faculty endorse this report and call for its immediate implementation. In this way, the Research Development Council would be able to begin supporting research at WPI as early as the summer of 1986.

Composition and Charge

In accordance with a 12 November 1985 memo from the Committee on Governance to the faculty, and action at the 14 November 1985 faculty meeting, the ad hoc committee comprises one member of the Committee on Governance (Moser) and two members of the Committee on Graduate Studies and Research (Peura and Sokal). Its charge includes:

- 1 -- making recommendations on
 - a -- the objectives, organization, and operation of the Research Development Council,
 - b -- the council's future level of funding and mode of operation, and
 - c -- alternative formulas for overhead return to active researchers and their departments; and
- 2 -- opening negotiations with the Dean of Faculty and the Dean of Graduate Studies and Research, with the goal of increasing RDC funding levels and percentages of overhead return.

The ad hoc committee met seventeen times and discussed its concerns and negotiated funding levels with Deans Richard H. Gallagher and William H. Taft. Elizabeth E. Miles, WPI Budget Officer, supplied important institutional and comparative data. The ad hoc committee also discussed this report with both the Committee on Governance and Committee on Graduate Studies and Research. Both standing committees have strongly endorsed this report's substance, but one or two members of each have expressed qualms about the way in which several sections are phrased.

Introduction

In presenting this report, the ad hoc committee wants especially to stress the positive experiences that many similar institutions have had with internal funding mechanisms for serious and committed scholars much like the one proposed here. To take just one example, several colleges in the State University of New York system have found that fully two-thirds of all researchers funded through local Research Development Councils were able to attract external funding for their research within two years of receiving internal support.

At its meeting on 14 November 1985, the faculty agreed that the council's budget for the 1986-87 academic year would be limited to \$100,000. In its first year, the RDC will thus be unable to respond to many of the demands on its resources that the ad hoc committee foresees. Through all of its negotiations with the Dean of Faculty, however, the committee received continual assurances that as RDC-funded researchers and scholars become productive and attract additional external research funds to WPI, the council's budget will grow accordingly. The ad hoc committee thus looks upon the RDC's first-year appropriation as an investment whose return has to be maximized. To ensure that these limited funds will be put to the best possible use, this report stresses accountability, and has the RDC (through its first year of operations) restrict its funding only to certain categories of research needs. This report also establishes mechanisms through which the RDC itself will regularly review the research performance of WPI faculty members and programs and the ways in which the Institute itself supports research.

An Appendix to this document discusses future funding requirements and alternative formulas for overhead return.

Respectfully submitted,

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Robert A. Peura
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Report of Ad Hoc
Committee
on Professional Dev.

5/22/86

Faculty

Approved

WPI Research Development Council

Introduction

The WPI Research Development Council will operate as one of the Institute's regularly funded programs. As such, it will annually receive an appropriation from the Institute's general funds, the level of which will be determined through ordinary budgetary procedures. It will be able to carry over unexpended funds from one academic year to the next, so that (for example) in May it could recommend the expenditure of funds during the following August. Support for the RDC will be sought through Campaign 125, with the goal of providing the council with its own permanent financial base. Though the council's funding level will not be tied directly to any external factors, its annual budget will grow as WPI researchers attract greater external research support and associated indirect cost return.

The Research Development Council, in cooperation with the Dean of Faculty and the Dean of Graduate Studies and Research (who will serve as its chair), will involve itself in all decisions relating to the allocation of WPI funds for the promotion of faculty research and scholarly activity. Most significantly, the RDC will evaluate requests for funding submitted by faculty members and research teams, and will disburse funds through the office of the Dean of Graduate Studies and Research. In this way, the council will facilitate the growth of research effort at WPI.

The Research Development Council will also regularly review WPI's support for research and scholarship, and recommend to the faculty and administration changes in policy and practice where and when it believes they are needed. In particular (as suggested earlier), as RDC-promoted research leads to increases in the amount of external funding received by WPI faculty members (and accompanying increases in the amount of overhead returned to researchers and their departments), budget adjustments will be required. The RDC, by reviewing the influences of these increases, will respond to them as appropriate.

Objectives

The WPI Research Development Council will aim most generally to nurture and develop excellence in research and scholarship among members of its faculty, in a way that will contribute to the Institute's overall effectiveness and standing. In particular, the RDC will provide relatively modest amounts of short-term financial support as "seed money" to faculty members and research teams, with an emphasis on those who currently lack off-campus funding. RDC support should not be provided to any one individual or research team over a long period of time, and will have as its general goal the acquisition of off-campus support for faculty research activity.

More specific objectives may be enumerated, including:

- 1 -- To foster research programs being developed by newly appointed faculty members.
- 2 -- To support researchers and scholars who have not previously been successful in attracting off-campus funding.

Such research initiation support would thus be made available both to relatively new faculty members and to others who have chosen to enlarge the research component of their professional activity. This funding would do much to help increase both the number of active researchers on campus and the number of research-based projects available to undergraduate and graduate students.

- 3 -- To foster the development of new research programs by experienced researchers.

The RDC would thus support the earliest work of newly-formed interdisciplinary teams, or provide assistance to faculty members developing research programs based upon undergraduate project activity, in a way that would contribute (with off-campus funding) both to future undergraduate project development and graduate student theses and dissertations.

- 4 -- To support those areas of research and scholarship in which WPI wishes to become especially well recognized.

Through such support, WPI could develop "centers of excellence" that would do much to improve the institution's overall effectiveness and standing.

- 5 -- To support researchers when necessary to maximize the success of their efforts.

This support would allow individuals to complete the final steps of a project, even after their off-campus funding had expired, in a way that would allow them to attract additional funding.

- 6 -- In general, to promote the preparation and submission of proposals for external funding of scholarship and research, as a means of stimulating this activity.

Such support would allow faculty members to bring together ideas and results from all sorts of sources -- previous research projects, successful undergraduate projects, intense literature reviews, etc. -- and would help them attract funding for future research activity.

- 7 -- To review on a regular basis WPI's support for faculty research activity, in a manner analogous to that adopted by the Committee on Administrative and Financial Policy, and to recommend changes in policy and practice where appropriate.

Among the activities that would be reviewed regularly are: the RDC's own level of funding, and the ways in which faculty members use the funds it awards; formulas for overhead return, and the ways in which researchers and their departments use such funds; and levels and kinds of research support at other independent technological universities. In addition, the RDC will require those individuals and research teams whose work it has funded to submit regular reports on their accomplishments, which will be published for general distribution on campus. In this way the RDC will ensure that researchers receiving RDC grants use these funds appropriately, and that its own objectives are being met.

Categories of Research Needs

The RDC will eventually assume responsibility for recommending at least seven different kinds of research support. Through its first year of operation, however, with its budget initially limited to \$100,000, the RDC will only be able to recommend support for the first five categories of research needs listed below.

- 1 -- Support for travel necessary to negotiate off-campus funding and limited supplies to complete proposals for such funding (see objective nos. 5 & 6)

- 2 -- Research initiation support for new researchers (see objective nos. 1 & 2)
- 3 -- Research initiation support for other faculty members developing new areas of expertise (see objective nos. 3 & 4)
- 4 -- Research completion and proposal preparation support (see objective nos. 5 & 6)
- 5 -- Support for other travel and publication expenses
- 6 -- Support for equipment repair and maintenance contracts
- 7 -- Support for major equipment acquisitions

In all cases, RDC funding will be limited solely to the amount needed to carry out the research in question and may, if appropriate, include graduate student stipends and limited summer support for faculty members.

Organization

The Research Development Council will consist of five established scholars who are actively involved in their own research programs: the Dean of Graduate Studies and Research (who will chair it) and four other members of the WPI faculty. One faculty member will be appointed annually by the Dean of Graduate Studies and Research for a one-year term, while the other three will serve rotating three-year terms. One of these members will be appointed by the Committee on Graduate Studies and Research from the faculty at large, the second will be appointed by an ad hoc group (consisting of the heads of the departments of chemical engineering, civil engineering, computer science, electrical engineering, management, and mechanical engineering, and of the biomedical and fire protection engineering programs), and the third by another ad hoc group (consisting of the heads of the department of biology and biotechnology, chemistry, humanities, mathematical sciences, physics, and social science and policy studies). As soon as the first council is appointed, its three term members will draw lots, to determine who will serve for one year, who for two years, and who for three years. When a faculty member completes a term on the RDC, his or her successor will be appointed by the appropriate committee or ad hoc group. The Director of Research Administration will provide the RDC with administrative and staff support.

General Operations

The Research Development Council will advise the Dean of Faculty on the expenditure of WPI funds in support of research and scholarship.

After the 1986-87 academic year, in meeting the research needs of newly appointed faculty members, the RDC will receive advice from the Dean of Faculty and the appropriate Department Head, and will expeditiously recommend funding at a level consistent with the other demands on its resources. Through its first year of operations, however, the RDC will not (with its limited budget) be able to recommend funds for such individuals, whose research needs have been (or will be) dealt with directly by the Dean of Faculty.

In all other cases -- i.e., for faculty members already on campus -- the RDC will recommend the distribution of funds only in response to formal proposals submitted by individual faculty members and research teams, though no long nor elaborate applications will be required.

The RDC will request short proposals for funding for expendable supplies, equipment repair (or maintenance contracts), travel, or publication at any time, and will expeditiously evaluate and act upon these proposals itself.

The RDC will request short (though somewhat longer) proposals for support of all other needs -- e.g., summer support, graduate student support, equipment, and the like -- in accordance with a schedule that it will announce annually. The council will seek on-campus and off-campus professional advice (in the applicant's field) for every such proposal it receives. Each proposal should thus include the names of two or three professionals in its area who might be called upon to act as referees, and the RDC may also seek advice from other competent individuals. The Director of Research Administration will provide the council with the administrative and staff support it needs to evaluate each proposal effectively and expeditiously.

In general, RDC support for any one researcher or team will be limited to one year. In rare cases, however, the RDC might favorably entertain requests for second-year funding, if the researcher involved could demonstrate how such support would build on and culminate the accomplishments of the first year. In any case, past recipients of RDC support will not be eligible for additional funding unless they can show (for example, through publications, the receipt of external support, or other off-campus recognition) that they used their previous grants effectively. In general, the RDC will base its recommendations for support largely on its judgment as to whether the proposed expenditure would be likely to lead to external funding in support of future research activity at WPI.

In recommending funding, in full or at a reduced level, or in rejecting a proposal, the RDC will provide both the Dean of Faculty and the applicant with a short explanation of its decision and, for funded proposals, set a deadline by which the applicant must report to the RDC on his or her use of the funds recommended.

Accountability

All individual and research-team recipients of RDC-recommended funding will report on their research and scholarly results by a deadline set when the funds are awarded. Reports on supply purchases, equipment repair, and the like will generally be expected very soon after the funds are expended, while reports on other activities may have longer deadlines. However, as recipients of RDC-recommended funds may not apply for further support from the council before they have reported on their use of the funds awarded earlier, reports may be submitted before they are formally due. The RDC will publish these reports for general distribution on campus. In considering proposals from a faculty member whose research (as an individual or team member) had earlier been funded by the RDC, the council will consult all earlier reports submitted by the individual, or by the teams of which he or she was a part.

Review

The RDC, with administrative and staff support from the Director of Research Administration, will regularly review WPI's support for faculty research, in a manner analogous to that adopted by the Committee on Administrative and Financial Policy. Based on this activity, the RDC will report annually to the faculty and administration, and will recommend changes in policy and practice -- particularly in connection with funding levels and formulas for overhead return -- where appropriate.

Among the mechanisms that the RDC will use in carrying out this charge are:

- 1 -- Each year the RDC will report on: (a) the number (and dollar amount) of the proposals it received; (b) the number (and dollar amount) of proposals it believed were worthy of support; and (c) the number (and dollar amount) of proposals it was able to support. Disparities between figures (b) and (c) should lead the RDC to recommend changes in its own level of funding.
- 2 -- Each year the RDC will request reports from researchers and their departments on their expenditures of overhead return, to insure that it has been used in support of research. With the data provided in such reports, the RDC will annually report on unmet needs and, if appropriate, recommend alternative formulas for overhead return.
- 3 -- After consultation with faculty members and administrators, the RDC will report annually on: (a) research areas at which WPI appears to be at the "take-off" stage; and (b) the support needed to bring these areas past the "take-off" stage. These annual reports will recommend equipment purchases, graduate-student support, and summer stipends, as appropriate.
- 4 -- With the assistance of the Dean of Graduate Studies and Research and the Director of Research Administration, the RDC will report annually on the level of WPI's support for research, in comparison with other members of the Association of Independent Technological Universities. In doing so, it will recommend whatever changes are needed (in its own budget, and in other kinds of support for research) to keep WPI competitive with other similar institutions.
- 5 -- Each year the RDC will report on departmental and program budget requests and goals statements, and on administrative responses to these requests.

Special Guidelines for the 1986-87 Academic Year

As continually noted, for the 1986-87 academic year, the council's budget will be limited to \$100,000. It thus can not recommend support for major equipment acquisitions, equipment repair and maintenance contracts, and research initiation funds for newly appointed faculty members. Their research needs have been (or will be) dealt with directly by the Dean of Faculty. In future years, however, the council will be expected to recommend support for such research initiation activity, and a commitment has been made to increase its budget accordingly.

For its first year of operation, the RDC will thus limit its consideration to requests for travel and publication expenses, supplies, and (in special cases) faculty summer support and graduate student stipends. In all cases, it will respond most favorably to those requests that demonstrate both a significant opportunity for scholarly accomplishment and a real need that would otherwise remain unmet. In general, the RDC will restrict its awards to a maximum for \$10,000 per faculty member, though teams of two or more faculty members exhibiting great potential and need might be funded at a higher level. Most awards will, however, be made at a lower level.

Faculty members are urged to discuss their needs informally with the Director of Research Administration before submitting proposals

Appendix -- Future Funding Requirements

Future annual RDC funding requirements may be estimated in several ways.

1 -- By comparison with similar members of the Association of Independent Technological Universities:

WPI most closely resembles six other independent technological universities [Carnegie-Mellon, Case Western Reserve, Clarkson, Lehigh, RPI, and Stevens] in terms of several major criteria, including size of engineering and science faculty [high (Lehigh) - 165; low (Clarkson) - 82; mean - 127; WPI (third) - 140], and number of engineering and science undergraduates [high (RPI) - 2781; low (Carnegie-Mellon) - 1297; mean - 1945; WPI (second) - 2322]. These seven institutions receive annually about \$75 million in external research funds [high (Carnegie-Mellon) - ca. \$22.7 million; low (Clarkson) - ca. \$1.9 million; mean - ca. \$10.6 million; WPI (sixth) - ca. \$2.1 million], or about \$86,000 per engineering and science faculty member [high (Carnegie-Mellon) - ca. \$215,000; low (WPI) - ca. \$15,000].

As these data demonstrate, the average amount of external funding received annually by members of the engineering and science departments at comparable institutions is about \$86,000. If WPI establishes this figure as a goal for its faculty, it must sextuple its total external research funding from its current level of about \$2 million to about \$12 million annually (i.e., 140 faculty members times ca. \$86,000). If a direct relation exists between internal and external funding, WPI must then increase its current level of internal support for research proportionally. The Dean of Faculty estimates that WPI currently provides about \$300,000 each year in direct internal support of research.

A sixfold increase in this amount requires that WPI provide about \$1.8 million in internal research funding annually, simply to meet an initial goal of reaching a mean level of external research support for each member of its engineering and science faculty.

2 -- By examining department and program 5-year goals statements:

Problems exist in comparing goals statements prepared by different departments and programs in that each defines terms in its own way, and all omit various important items that others include. Nevertheless, they provide data from which certain minimum needs can be derived. These statements, submitted in December 1985, request average annual resources in support of research (through the 1990-91 academic year) as follows:

Months of summer support for faculty members -- 16.5 (with summer salaries estimated at \$3,500 per month) --	\$57,750
Graduate Research Assistants -- 23 (with full-year stipends estimated at \$15,000 each) --	\$345,000
Research Equipment, Computers, and Software	1,564,600
Equipment Maintenance --	29,000
Supplies and Materials --	31,050
Travel and Seminars --	15,300
"Seed Money" --	40,400

Total -- \$2,083,100

3 -- By estimating funding levels from research needs

In preparing these estimates for a 200-person faculty, the ad hoc committee assumed that each year about 10 percent of the faculty (i.e., 20 professors) would be newly appointed and require research initiation support; about 5 percent (10 professors) would be developing new areas of expertise and require research initiation support; and about 5 percent (10 professors) would be completing research or preparing proposals and require support for these activities. The committee also assumed that not all of these professors would require summer support, and estimated average faculty summer salary levels at about \$3,500 per month and full-year stipends for graduate research assistants at about \$15,000.

a -- Annual research initiation support for new faculty members:	
15 professors, @ \$3,500 per month for two months --	\$105,000
20 graduate research assistants, @ \$15,000 --	300,000
Supplies: \$2,000 for each of 20 professors --	40,000
Equipment: \$20,000 for each of 20 professors --	<u>400,000</u>
	\$845,000
b -- Annual research initiation support for other faculty members developing new areas of expertise:	
10 professors, @ \$3,500 per month for two months --	\$70,000
10 graduate research assistants, @ \$15,000 --	150,000
Supplies: \$2,000 for each of 10 professors --	20,000
Equipment: \$20,000 for each of 5 professors --	<u>100,000</u>
	\$340,000
c -- Annual research completion and proposal preparation support:	
10 professors, @ \$3,500 per month for two months --	\$70,000
d -- Annual support for equipment repair:	
Assuming 100 active researchers, each using new equipment worth about \$30,000; and the availability of maintenance contracts at about 10 percent of the equipment's value --	\$300,000
e -- Annual support for major equipment acquisitions --	\$200,000
f -- Annual support for travel and publication --	\$25,000
	Total -- \$1,780,000

The mean of these three estimates is \$1.89 million. Since WPI can not raise the council's budget from \$100,000 to almost \$2 million overnight, this amount (corrected for inflation) could serve as a goal for the RDC annual budget towards which the Institute should work over a five year period. If WPI adopts this goal in 1986-87, and if inflation continues at about 5 percent annually, the RDC budget for the 1990-91 academic year should be ca. \$2.30 million.

One way in which this figure could be reached would be to increase the RDC's budget each year by a factor of 2.2. If WPI adopts this procedure, the RDC's budget for the 1990-91 academic year would be ca. \$2.34 million, and would average about \$850,000 annually during the five year period.

Whether or not WPI adopts this goal, the RDC will continually recommend to the faculty and administration changes in funding formulas as appropriate. In particular, as the large investment called for throughout this report yields dividends, RDC funding levels should be adjusted.

Alternative Formulas for Overhead Return

Of the ca. \$2.1 million in grants that its faculty members are currently awarded each year, WPI receives ca. \$600,000 in indirect-cost reimbursement from the sources of these grants. Assuming that current federal Office of Management and Budget attempts to limit reimbursement of these overhead costs fail, this sum should rise as the amount of funds awarded to WPI faculty members by all funding sources increases. Assuming a constant ratio, when WPI researchers are awarded ca. \$12 million a year in grants, WPI will receive ca. \$3.5 million in indirect-cost reimbursements.

As part of its review function, the RDC will continually examine and evaluate WPI's use of these funds, and will thus ensure that overhead returned to researchers and their departments will be used solely for research purposes. In addition, it will recommend changes in policies and practices as appropriate, particularly in relation to overhead return to researchers (now 15%) and their departments (now 10%).

Meanwhile, the percentages of overhead returned to researchers and their department should be increase gradually during the next five years, until they reach 30% (to researchers) and 20% (to their departments).