

Recommendations to SPRAC on facilitating interdisciplinary and collaborative research and teaching

Subcommittee on the pursuit of quality, innovation, incentives, risks and rewards

Pam Benoit
Martin Bergee
Jim Coleman, Chair
John David, ex officio
Nancy Flournoy
Chris Hardin
Joe Kornegay
Elaine Lawless
Gerry Meininger
Satish Nair
Kathy Newton
Bart Wechsler
Bill Wiebold
Roger Worthington
Steve Zweig

November 22, 2006

According to MU's Mission and Vision statements, MU wants to:

"Be known as an institution where ... creative cross-disciplinary, collaborative programs bring distinction...."

"Be a leader in the development of innovative national research consortia in MU's areas of unique expertise and competitive/comparative advantage..."

"Especially encourage creativity that crosses disciplinary and departmental lines to form collaborative programs of distinction."

Creative research increasingly occurs in collaborative teams and/or at the junctions among traditionally disparate disciplines. As research at MU enters these new fields the work of some of our faculty members will quite appropriately depart markedly from established academic patterns. If we really want to encourage the behaviors in our Vision and Plan, then we need to be sure that our internal incentive and reward systems support that Vision and Plan for the ultimate benefit of the institution as well as individual faculty members. With finite funds for higher education, the processes of continual renewal and a more dynamic resource model are essential to remain competitive in research and teaching.

Use of awards

Develop a series of new awards to send a message that the university specifically values collaborative and interdisciplinary research/creative activity and teaching. If we want to have more collaborative interdisciplinary team-based activity then we need to find ways to both facilitate the development of the teams and then to prominently recognize their successes. Examples could include:

- A new Chancellor's Award for Collaborative and/or Interdisciplinary Research and Creative Activity
- A new Provost's Junior Faculty Award for Interdisciplinary Research and Creative Activity
- A new Provost's Award for Interdisciplinary Teaching/Course Development
- A new Graduate Dean's Graduate Student Mentor Award in Interdisciplinary Research/Creative Activity
- A new Graduate Dean's Superior Graduate Student Award for Interdisciplinary Research/Creative Activity
- A new Provost's Undergraduate Student Mentor Award in Interdisciplinary Research/Creative Activity
- A new Provost's Undergraduate Student Award for Interdisciplinary Research/Creative Activity

Appoint a new internal advisory committee of researchers successful in collaborative interdisciplinary research/creative activity to recommend recipients for any new awards.

Research funding incentives

The university should focus internal funds for research in a manner that encourages interdisciplinary research. For example, Research Council, PRIME and Research Board funding mechanisms should explicitly foster interdisciplinary research. Two recommendations are:

- Add review criteria to the normal review of proposals to the Research Council and the Research Board that support interdisciplinary behavior. This would not involve any set aside funds but would clearly give some preference to interdisciplinary proposals. Research Council should also provide a mechanism for financial support of interdisciplinary conferences organized by MU faculty.
- Develop a new internal grants program specifically for collaborative research/creative activity that is based on interdisciplinary teams of faculty. This would provide seed funding for proof-of-concept work allowing researchers in different disciplines to develop joint research plans and to perform initial data collection. This "venture capital" for interdisciplinary work could range from \$5,000 to \$50,000. In addition to seed money, interdisciplinary research projects will often need space and support staff. This should be a departmental match for the campus seed monies. A research review committee experience with and having vision for interdisciplinary research should be formed to evaluate proposals for this mechanism. One source of funds could be from targeted fundraising and a "named program." Another source could come from successful licensing of university technologies.

MU should also use other institutional research resources to promote interdisciplinary research:

- For proposals submitted to national funding agencies in response to calls for interdisciplinary research proposals, any matching funds would have priority for PRIME funds.
- For new faculty recruited to build interdisciplinary research, there should be funds available from the Office of Research to assist in building attractive start-up packages.
- The campus might consider an additional allocation of RIF toward faculty participating in externally funded interdisciplinary research grants and contracts (e.g., an amount equivalent to an additional 5% of the F&A generated above the normal 25%). A faculty committee, such as the PRIME committee or the research review committee (see above), would need to develop a specific policy such as this, and would have to design a rigorous mechanism to identify grants and contracts that would qualify for such additional RIF.
- Ensure that MU's investments in research resources to support interdisciplinary research are carefully and periodically reviewed. Furthermore, ensure that resources will be reallocated away from funding mechanisms that are determined through review to not have the desired effect on promoting interdisciplinary research to other existing or new mechanisms that can produce the desired facilitation of interdisciplinary efforts.

Teaching incentives

MU should provide incentives for departments and individual faculty to initiate and offer interdisciplinary courses at both the undergraduate and graduate level. Effective interdisciplinary teaching should be included as a criterion in program review. Incentives could include:

- Course development seed money
- Workshops in interdisciplinary course development
- Developing a mechanism for shared credit for interdisciplinary (possibly with multiple faculty) courses (shared teaching credit similar to shared research credit). In cases where each member of a team is fully engaged throughout the course, then dual credit (double counting) is most appropriate
- Focus internal professional development funds for faculty who are developing interdisciplinary courses.

Curriculum incentives

MU should provide incentives for departments and individual faculty to initiate and offer interdisciplinary certificates, minors, emphasis areas, concentrations, and degrees at the undergraduate and graduate level. Recommendations include:

- Create mechanisms for the recruitment of students into interdisciplinary programs (currently students apply to departments and there isn't a good mechanism for them to express an interdisciplinary interest)
- Creating a mechanism for double counting students in interdisciplinary degree programs and departments
- Establishing interdisciplinary graduate fellowships
- Developing a mechanism for reflecting shared credit for co-mentorship of interdisciplinary students across multiple departments
- Creating organizational structures to facilitate interdisciplinary programs across college and department boundaries
- Encouraging joint recruitment, funding, and co-hiring of faculty to facilitate the development and delivery of interdisciplinary programs
- Building a straightforward process for appointing faculty to interdisciplinary programs and recognizing the contributions of faculty in these programs (see later sections)
- Developing modest resources to support interdisciplinary programs (e.g., a director who receives a stipend, an operating budget, administrative support staff, office space).

Use of Public Forums

A key part of changing faculty behavior is changing the campus culture. Thematic research days have been a useful tool to promote a culture of research within the theme. The Office of Research, The Graduate School, and other facets of the central MU administration could promote interdisciplinary research by either sponsoring interdisciplinary components of existing research forums (talks, poster sessions, awards, etc.) or creating a new interdisciplinary research forum on campus. This can initially be done by adding interdisciplinary themed sections/days to existing research showcase events such as Life Sciences Week or the Undergraduate Research and Creative Activities Forum, and the Saturday Morning Science series at the LSC.

Use of university resources to promote hiring of faculty members with interdisciplinary interests

Most hiring is done by individual departments to fill teaching and/or research needs within the departmental field. Therefore there is little incentive in the hiring process to select an interdisciplinary scholar. The departments may be encouraged to hire interdisciplinary scholars by creating a climate of bringing in other departments/divisions into the process for new hires to combine resources and to foster collaborative hiring:

- Encourage joint recruitment and appointment of faculty to engage in and catalyze interdisciplinary research and teaching through resources available centrally. For example, for a faculty member hired jointly between two departments or a department and center, the two units share the salary (1/3 in each unit) and 1/3 from the campus.
- Develop a mechanism for shared credit for interdisciplinary (possibly with multiple faculty) research and teaching. In cases where each member of a team is fully engaged throughout the research project or course, then dual credit (double counting) is most appropriate.
- Clarify the way by which grants conducted in interdisciplinary centers are credited to at least be neutral if not a positive for the academic departments (departments with faculty in centers should not lose research rankings because of shared credit).

Use of graduate fellowships to promote interdisciplinary research of mentors

Faculty are often more willing to explore new research areas if there is a Ph.D. student (already paid for) who is interested in building the new research bridge. A change in the culture of graduate training and graduate students may be a powerful force to change the culture of the faculty. On the MU campus we have few centrally funded graduate assistantships (Life Sciences Fellows and some fellowships through the graduate school). Interdisciplinary graduate training can only be feasible with central funding of fellowships. Unfortunately we appear to be far behind some other universities, such as the University of Arizona, in establishing interdisciplinary graduate training.

Implementing interdisciplinary graduate training at MU could involve (in order of ease of implementation):

- Using existing fellowship funds for interdisciplinary graduate fellowships
- Creating a system by which deans and chairs contribute to the support of their students in interdisciplinary programs

- Creating a new pool of funds for interdisciplinary graduate fellowship support

Depending on the size of central fellowship support, this mechanism could serve as a focal point for the reorganization of graduate training on the MU campus.

An existing pool of central fellowship support currently exists as the Life Sciences Fellowship program which currently supports pre-docs and post-docs in the traditional Life Sciences fields. The funding for the Life Sciences Fellowships might be used to help fund students in a new program of Integrative Life Sciences Doctoral Training. This model is currently being discussed across campus. If it develops momentum among faculty and departments, a program of this type could jump start interdisciplinary training and research within the life sciences at MU and begin to break down departmental barriers to interdisciplinary training. But, the discussions are currently at an early stage.

Promote the establishment of new interdisciplinary research models and themes

MU should provide seed funding for proof-of-concept work that allows researchers in different disciplines to develop new organizational models that enable interdisciplinary research.

MU should provide special facilities, finances, and freedom for international and national scientists from outside MU to pursue collaborative, interdisciplinary research with MU faculty by bringing those scientists and/or members of their research groups to campus to work for periods ranging from a few weeks to a year. The Big 12 Fellowship program is an example of the sort of mechanism needed if not restricted to the Big 12 but available anywhere. MU should provide hotel space - benches set aside for temporary occupancy - to provide an opportunity for researchers to work in proximity during the early stages of interdisciplinary projects and perhaps simply to investigate the possibility of collaboration.

MU's current investments, and new investments, in interdisciplinary centers must be carefully and periodically reviewed, and there must be a willingness to move resources from unproductive interdisciplinary centers, toward the support of new centers in emerging, exciting interdisciplinary areas that make sense for the campus.

Make collaborative and interdisciplinary research and teaching a criterion in program evaluation/review

MU should ensure that all forms of program evaluation/review also include the contributions through collaborative and interdisciplinary activities. This will frequently require double counting in for example publications, grants, graduate student mentoring, and teaching.

Assessment of interdisciplinary research can examine, for example:

- The extent to which researchers truly collaborate with other researchers in adjacent or complementary fields or stimulate the development of a new field.
- The degree to which new technologies are developed that enhance research capabilities in many fields through the development of new instrumentation or informational analysis.

- The extent to which researchers work on topics that could not be addressed in a single discipline.
- Careful citation analysis revealing a broad interdisciplinary interest in the work.

Develop mechanisms to evaluate and reward collaborative and interdisciplinary activities in annual performance evaluations and P&T decisions

If MU truly has the vision and goals to: (1) be known as an institution where ... creative cross-disciplinary, collaborative programs bring distinction...; (2) be a leader in the development of innovative national research consortia in MU's areas of unique expertise and competitive/comparative advantage...; and (3) especially encourage creativity that crosses disciplinary and departmental lines to form collaborative programs of distinction, then we must align our promotion and tenure process in a manner that identifies, appropriately evaluates, and appropriately rewards interdisciplinary and collaborative research. Some suggestions for incorporating the importance of interdisciplinary and collaborative research into the P&T process include:

- MU and its Schools, Colleges and Departments should ensure that language exists in their P & T documents that specifically address the relative importance of collaborative and interdisciplinary scholarly activities. The only college identified as having specific language that encourages, even requires, collaborative *and* interdisciplinary work for promotion and tenure is the School of Nursing (SON), as evidenced in the following sentences: “Actively engages in independent or collaborative research or other scholarly activities”; “Maintains independent and collaborative focused program of research;” “Lead interdisciplinary, inter-university research team.” The first two sentences here are related to the issue of tenure and promotion to associate professor; the third is specific to promotion to full professor. It fair to say that the Dean of SON believes that this specific support of collaborative and interdisciplinary research in SON has played a significant part in the dramatic growth in research experienced by the School of Nursing over the last few years propelling them to 18th of 102 Nursing Schools (from way back in the pack) in NIH funding.
- A strong statement of the value to the Campus of interdisciplinary work should be included in the Provost's promotion & tenure call for dossiers, and explicitly allowing for documentation on interdisciplinary work to be included in the dossier. It would also be helpful if there were some articulation of what is highly valued.
- MU should abolish the current mechanism by which faculty are asked to assign a relative percentage contribution of each participant in collaborative research publications and projects. This approach automatically assigns single authored works (where the author gets 100% credit) more value than multi-authored works (where the author must get less than 100% credit), sometimes independently of the value of the work to the scholarly community, or without any real insight into the specific intellectual role that each author played in the publication. Rather, MU should move to a process that relies on a more complete annotation of each collaborative publication and project. That annotation should focus on the specific intellectual contribution of each participant (many current annotations focus on the activities of each author rather than the intellectual contribution), and should clearly articulate the significance of the publication venue. Because this recommendation would require that faculty prepare careful and informative

annotations, we also recommend that the campus create and maintain a file containing examples of well articulated annotations that can be easily accessed by faculty during their preparation of materials for annual performance reviews and P&T dossiers.

- The best people to speak to the intellectual role of a given person in collaborative scholarship are often the collaborators. Units might consider including comments from external referees who have collaborated with P&T candidates regarding the candidate's role in their collaboration. If provided in the dossier, they must be considered at the college and campus levels.
- Units might also consider making sure to include external referees who are personally engaged in interdisciplinary efforts.
- Interdisciplinary research can result in fewer substantive results and publications in the time frame of a standard tenure-probationary period. The University might consider a process by which the probationary period can be extended for faculty actively engaged in interdisciplinary research. If a faculty member requests such an extension, and if that faculty member works in interdisciplinary area, the extension should be granted.
- The campus needs to provide mechanisms whereby new faculty can receive guidance and mentorship on doing collaborative, interdisciplinary research and teaching, and on how to successfully articulate interdisciplinary activities such that they are clearly understood and appropriately valued during the P&T process.

Summary Statement

The SPRAC Subcommittee strongly believes that MU needs to exert significant energy and resources toward facilitating interdisciplinary and collaborative research and teaching if we truly wish to stay competitive, let alone increase our stature, among the Nation's best universities. Implementation of the full package of recommendations discussed above would significantly improve the competitiveness of MU for recruiting and retaining the faculty and students with the necessary talents to ensure that the institution achieves the vision and mission of:

- *"Be known as an institution where ... creative cross-disciplinary, collaborative programs bring distinction...."*
- *"Be a leader in the development of innovative national research consortia in MU's areas of unique expertise and competitive/comparative advantage..."*
- *"Especially encourage creativity that crosses disciplinary and departmental lines to form collaborative programs of distinction."*

Implementation of only a portion of the package may have little effect at all where what we really need is the equivalent of a sea change. Therefore, we strongly recommend that SPRAC make a strong recommendation to the Chancellor to implement the full set of these recommendations. We believe that implementing these recommendations can help transform the campus environment to one where the high value of collaborative and interdisciplinary intellectual activity is evident across campus actions, policies and resource allocation strategies.

References:

Buss, J. (2003, June). *Why interdisciplinary graduate programs attract graduate students*. Merrill conference in the series: The Research Mission of Public Universities.

Feller, I. (2005, Nov 2-5). *Beyond initiatives: The problematic institutionalization of interdisciplinary graduate degree programs in American research universities*. Paper presented for the 2005 International Conference, Challenges to Innovation in Graduate Education, Toronto, Canada.

Roberts, J.A. (2004, July). *Riding the momentum: Interdisciplinary research centers to interdisciplinary graduate programs*. Merrill conference in the series: The Research Mission of Public Universities.

Sá, Creso (2005, Nov 17-19). *Change at the academic core: Organizational innovations to promote interdisciplinary research*. Paper presented at the ASHE Conference, Philadelphia, Pennsylvania.

The National Academies (2005). *Facilitating interdisciplinary research*. Washington, D.C.: National Academies Press.

Von Braun, M. (2005). *How interdisciplinary leaders can strategically plan for and administer interdisciplinary programs*. Project Kaleidoscope. <http://www.pkal.org>

|
revised 11/22/06