TASK FORCE ON MULTIDISCIPLINARY

LEARNING AND TEAM TEACHING

FINAL REPORT

FALL 2005

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TASK FORCE REPORT ON MULTIDISCIPLINARY LEARNING AND TEAM TEACHING

EXECUTIVE SUMMARY

Charge to the Task Force

President Mary Sue Coleman convened the Presidential Task Force on Multidisciplinary Learning and Team Teaching in Fall 2004. Her message to the Task Force stated that one of the University of Michigan's defining characteristics is its interdisciplinary research, and she charged the Task Force with determining how to embed more interdisciplinary and multidisciplinary topics in the intellectual training that U-M provides for its students, especially undergraduates. The charge noted: "Our students should learn to embrace new and emergent ideas and should develop the skills to collaborate with others who bring perspectives to a problem that are different from their own." The charge also asked the Task Force to find "greater opportunities to pair faculty from divergent disciplines to design and teach new classes or to enrich existing classes." She put special priority on increasing the involvement of graduate and professional school faculty in team teaching efforts at the undergraduate level (see Appendix I).

Composition and Work of the Task Force

The members of our task force were chosen from a variety of disciplines and areas of the University. We held a series of meetings during the 2004-2005 academic year and met with the Provost and numerous faculty and staff who had been involved in interdisciplinary team teaching efforts or in supporting team teaching in an administrative capacity. A complete list of task force members and those with whom we met is included in Appendix II.

Value of Interdisciplinary Learning and Team Teaching

The task force has concluded that the University of Michigan should launch a central funding initiative that combines new interdisciplinary courses and programs with new opportunities for team teaching; the combination will provide maximum leverage of University resources. We believe that the major problems of our time, from the environment to poverty, from human rights to terrorism, from religious movements to health care, cannot be studied effectively within any single discipline; all involve integrative thinking. In order to prepare for a life of productive endeavor in the 21st century, undergraduates at the University of Michigan must learn problem solving across disciplines and launch inquiries in uncharted territories of knowledge and practice. They must examine the assumptions that inhere in a disciplinary perspective and integrate material outside of patterns they are taught. They must locate issues within larger frameworks of thought, negotiate multiple perspectives, and develop habits of critical questioning and creative problem solving. And they must learn how to find their way through disconnected bodies of information and perspectives and create their own path to an education that coheres.

For the past four decades, national associations and task forces charged with improving the academy have issued myriad reports recommending that integrative learning be a key component of the undergraduate experience. As a result, interdisciplinary teaching has become a central part of curricular reform at institutions all across the country. Many liberal arts colleges feature comprehensive interdisciplinary courses and programs that give them a competitive edge in student recruitment. At research universities, it is harder to find good examples of the kind of interdisciplinary teaching that is so prevalent at smaller schools.

Research universities should offer their undergraduate students the opportunity to benefit from all of their schools and colleges and the wealth of resources on their campuses. The Boyer Commission's *Reinventing Undergraduate Education* report recommended in 1998 the kind of initiative that this Task Force is now proposing for the University of Michigan:

> Universities need to take advantage of the immense resources of their graduate and research programs to strengthen the quality of undergraduate education, rather than striving to replicate the special environment of the liberal arts colleges. There needs to be a symbiotic relationship between all the participants in university learning that will provide a new kind of undergraduate experience available *only* at research institutions. Moreover, productive research faculties might find new stimulation and new creativity in contact with bright, imaginative, and eager baccalaureate students, and graduate students would benefit from integrating their research and teaching experiences. Research universities are distinctly different from small colleges, and they need to offer an experience that is a clear alternative to the college experience. [italics in original.]
>
> Boyer Commission on Educating Undergraduates in the Research University. 1998. *Reinventing Undergraduate Education: A Blueprint for America's Research Universities.* Stony Brook, New York: Carnegie Foundation for the Advancement of Teaching: 7-8.

When we refer to interdisciplinary courses, we mean ones that synthesize two or more disciplinary perspectives to create new knowledge. In these courses, instructors compare and contrast disciplines – and consciously draw from different theories and research methods to address whatever problems are the subject of the course.

In many cases, the impact of an interdisciplinary course is maximized when it is team-taught by two or more faculty who collaborate on the design, teaching and evaluation of students. This process allows the faculty members to model intellectual and logistical collaboration for their students, thus training them for the collaborative work that awaits them in most careers after graduation. It also allows faculty to learn from one another on multiple levels: course content, pedagogical approaches, and classroom interaction.

The University of Michigan Context

Currently, there are no University-wide programs to support development of large-scale team-teaching efforts or interdisciplinary degree programs for undergraduates. Such initiatives historically have often been driven by and supported on an ad hoc basis from a variety of provostial, school/college and external sources.

The University of Michigan is well-known throughout higher education as an institution that prioritizes interdisciplinary connections. A substantial number of U-M faculty have joint appointments in two or more departments, and interdisciplinary research thrives here. U-M has all the ingredients for a major initiative that could lead to substantial advances in undergraduate learning at this institution; for example:

- U-M has *faculty with broad expertise*; no matter what the academic subject, there are likely to be faculty experts who could team teach courses on complex, multi-faceted topics.
- There are a multitude of *existing collaborative interdisciplinary research centers and networks* at U-M, and they can serve as the basis for creating cross-unit instructional teams.
- The *breadth and strength of the U-M graduate and professional schools* make their faculty ideally positioned to augment the undergraduate educational experience; they are close to their professions and closely aligned intellectually to areas of intense undergraduate interest.
- There are already *small-scale models of interdisciplinary courses and team teaching* at U-M, such as integrated lecture courses, meet-together courses, and learning communities.
- *Intergenerational instructional teams* are another model of team teaching; they draw from the large U-M cohorts of talented individuals at each stage of their academic careers: faculty, post-doctoral fellows, graduate students, and upper and lower division undergraduates.

Barriers to Interdisciplinary Team Teaching at U-M

Despite the wealth of resources for interdisciplinary team teaching at U-M, it occurs relatively infrequently. Most of the University's interdisciplinary courses and programs reside within undergraduate schools and colleges as opposed to being offered across schools and colleges. Within these interdisciplinary programs, it is usually individual faculty who offer courses, not pairs or teams of faculty. In fact, of all U-M courses, both undergraduate and graduate, only about 3.0% are team taught, and only one-third of those are team-taught by faculty from different departments and programs.

From a U-M administrative perspective, there are obvious barriers to interdisciplinary team teaching:

- The *University's decentralized structure*, with schools and colleges having significant authority for curriculum, budget and planning, is both an asset and a challenge; it is logistically and financially difficult to support team teaching involving faculty and students from several schools and colleges.
- As a public university, U-M provides education and access on a broad scale that results in *high student-faculty ratios*; team teaching arrangements must serve large numbers of students or rely on new sources of instructional staffing.

- The *missions of U-M's professional schools* differ from those of the undergraduate colleges, and undergraduate teaching is not among their highest priorities for faculty time or for allocation of other resources.
- The *professional lives of U-M faculty are already very full*, and for most faculty members, there are many more high value activities than they have time for; it is difficult to add new priorities to their existing workload.

From the perspective of individual U-M faculty, there are other barriers to interdisciplinary team teaching:

- As compared to a discipline-centered course with a single instructor, team teaching across disciplines requires more *resources* -- time and energy for intellectual and logistical planning, as well as greater development of course materials.
- Most faculty do not know where to find the *information and expertise* about team teaching and interdisciplinary learning that they need to succeed in this endeavor.
- Individual faculty have concerns about how engaging in interdisciplinary team teaching may impact their own tenure and promotion. The *reward system* is not geared to supporting interdisciplinary team teaching.
- Faculty who team teach across departments or schools and colleges face *administrative and bureaucratic barriers* involving credit for teaching, course administration, compensation, and workload, among other topics.
- Faculty, graduate student instructors and undergraduate course assistants face a variety of *student issues*, e.g., teaching students with disparate backgrounds and interests and overcoming student enrollment issues caused by extant distribution requirements or lack of interest in interdisciplinarity within the participating units.

RECOMMENDATIONS OF THE TASK FORCE:

Recommendation 1

The University should launch a major funding program to support complex initiatives that incorporate team teaching and interdisciplinary learning in undergraduate instruction.

We recommend that the Provost's Office administer the program and that the program should have a steering committee, composed largely of faculty, that will play an active role in making funding decisions. An important criterion for support of an initiative is that it fit well with the plans and priorities of the units involved, at the department/program and at the school/college levels. Successful proposals must make a convincing case that the initiative will attract strong enrollments and can be sustained past the start-up funding from this program. We recommend that this Program be funded for five years with an evaluation of its success early in its final year. By way of goals for this five-year period, the Program should seek to support at least three initiatives that lead to new high enrollment courses or course sequences as well as three new cross-unit degree programs.

Recommendation 2

The support model offered by the CRLT Interdisciplinary Faculty Associates (IFA) Program should be enhanced so as to broaden the level of interest and involvement in the Program.

CRLT's IFA Program has been highly successful in seeding faculty-initiated undergraduate interdisciplinary team teaching efforts. The IFA program plays an important complementary role to the funding program proposed in Recommendation 1 that would support more complex initiatives. The Task Force recommends that the IFA program be enhanced with more effective (multi-year) support packages and funding to cover faculty participants from more fields. A five-year support package should be provided to CRLT for the IFA Program, to be coordinated with the larger initiatives proposed under Recommendation 1, with the website development proposed under Recommendation 3, and with CRLT's role in developing an annual institute on interdisciplinary collaborative teaching and other support mechanisms for the larger initiatives.

Recommendation 3

The University should put in place effective means to disseminate information and advice that will be of value to faculty who are engaged in team teaching and interdisciplinary learning efforts. Given that this information will be of potential value to faculty across the University, the Provost's Office (perhaps through its reporting units) should take the lead in this effort. Dissemination mechanisms include:

(A) A "point person" to serve as an advocate and coordinator of interdisciplinary collaborative teaching.

(B) A web site dedicated to team teaching and interdisciplinary learning with pedagogical advice for faculty; campus resources, including potential funding sources; and information about how to certify courses so they satisfy graduation requirements.

Recommendation 4

The Provost should convene a working group to recommend changes to budgetary policy and practice that would reduce barriers or provide financial incentives for team teaching and interdisciplinary degree programs. One specific focus of this group would be to look at opportunities for graduate and professional schools at Michigan to increase their involvement with undergraduate teaching and degree programs. Important topics for this group to consider include the following:

(A) Deciding whether there should be standards for levels of compensation that a unit should receive when one of its faculty members teaches (or team teaches) a course for another unit.

(B) Recommending models for undergraduate programs that are shared between schools and colleges. Each model should delineate how curricular roles and responsibilities, costs and revenues would be shared between the participating units.

(C) Recommending programs that the Provost could put in place to provide financial incentives for schools and colleges to support team teaching across units.

Conclusion: The Scope of the Challenge

Nearly everyone believes that the university should do more team teaching and should support more interdisciplinary learning. Much of the knowledge needed to make this transition must be gained through the process of learning-by-doing, which is always much more expensive than staying with what is already known. Are the benefits of team teaching and interdisciplinary learning truly worth the cost the University must bear to make the transition, especially at a time of severe fiscal stress? The task force recognizes that this is a controversial question, but we believe the benefits outweigh the costs. Our conclusions are grounded in the claims that society at large needs graduates with skills that can come only from innovations such as team teaching and interdisciplinary learning, and that the challenge is manageable because the university has already demonstrated its capability to make such shifts.

FINAL REPORT

TASK FORCE REPORT ON MULTIDISCIPLINARY LEARNING AND TEAM TEACHING

FALL 2005

1. STRATEGIC CONSIDERATIONS

A. CHARGE TO THE TASK FORCE

In the spring of 2004, University of Michigan President Mary Sue Coleman delivered to the Regents a major address in which she laid out her vision for the University. As a follow-up to this address, President Coleman convened a set of task forces in the summer of 2004, each charged to study and recommend steps to transform a key aspect of University activity. The topics chosen for these task forces were: Multidisciplinary Learning and Team Teaching, Residential Life and Learning, Ethics and the Public Life and Health in the Workplace. This document is the final report of the task force on Multidisciplinary Learning and Team Teaching.

The formal charge to our task force is contained in Appendix I. We were asked to recommend steps that would increase team taught courses and interdisciplinary programs through the creation of incentives and the removal of barriers. Our charge also placed high priority on recommendations that would address two specific questions. First, are there ways to increase the involvement of graduate and professional school faculty in team teaching efforts at the undergraduate level? Second, are there steps to encourage team teaching and multidisciplinary learning that will complement the recommendations made by the other task forces, in particular the Residential Life Initiative Task Force, and the task force on Ethics and the Public Life?

Our task force focused its considerations on the undergraduate level, although many of our recommendations will apply equally to instruction at the graduate level. There are important differences however, and particular ways in which team teaching and the support of interdisciplinary courses and programs is more challenging at the undergraduate level. One complication at the undergraduate level comes from the fact that the scale of our undergraduate instructional mission is vastly different than the scale of our corresponding graduate mission. Moreover, Rackham, through a variety of mechanisms, plays an important support role for instructional programs at the graduate level—especially with activities, either multidisciplinary programs or team teaching—that cross schools and colleges. There is no comparable school or college at the undergraduate level.

B. MEMBERS & WORK OF THE TASK FORCE

The members of our task force were chosen from a variety of disciplines and areas of the University. We held a series of meetings during the 2004-2005 academic year and met with the Provost and numerous faculty and staff who had been involved in

interdisciplinary team teaching efforts or in supporting team teaching in an administrative capacity. A complete list of task force members and those with whom we met is included in Appendices II and III.

C. MOTIVATION AND IMPORTANCE OF ADDRESSING THE NEED FOR INTERDISCIPLINARY LEARNING

Undergraduate education at the University of Michigan is excellent already. From large lecture classes to seminars, students here benefit from the spectacular intellectual energies of faculty who are constantly learning themselves. We have a decentralized system that puts curricular development in the hands of Deans, Chairs, and individual faculty to ensure that the latest innovations in disciplinary thinking are available to our undergraduates. Over the past three decades, our faculty have developed courses and programs marked by interdisciplinarity to keep pace with the emergence of new fields of inquiry. Why change this productive system by putting special emphasis on interdisciplinary collaborative teaching now? What would such a change add to the education of our undergraduates?

The impetus for this initiative is directly traceable to the University's social commitments. The major problems of our time, from the environment to poverty, from human rights to terrorism, from religious movements to health care, cannot be studied effectively within any single discipline; all involve integrative thinking. In order to prepare for a life of productive endeavor in the 21st century, undergraduates at the University of Michigan must learn problem solving across disciplines and launch inquiries in uncharted territories of knowledge and practice. They must examine the assumptions that inhere in a disciplinary perspective and integrate material outside of patterns they are taught. They must locate issues within larger frameworks of thought, negotiate multiple perspectives, and develop habits of critical questioning and creative problem solving. And they must learn how to find their way through disconnected bodies of information and perspectives and create their own path to an education that coheres.

U-M has outstanding faculty who come to this public university to engage undergraduates as much as they engage with colleagues in distinguished and path-breaking research both here and throughout the world. Thus, the rapidly transforming world puts the research university in the position of not only ensuring that great collaborative research ventures respond to the interdisciplinary questions identifiable today but also of ensuring that we educate students to formulate inquiries, responses, and civic participation needed to address the problems of the future. Much of the potential value is possible only at a research university. In 1998, the Boyer Commission on Educating Undergraduates in the Research University, created by the Carnegie Foundation for the Advancement of Teaching, focused on a unique opportunity that research universities provide for their students. They wrote:

Universities need to take advantage of the immense resources of their graduate and research programs to strengthen the quality of undergraduate education, rather than striving to replicate the special environment of the liberal arts colleges. There needs to be a symbiotic relationship between all the participants in university

learning that will provide a new kind of undergraduate experience available *only* at research institutions. ... Research universities are distinctly different from small colleges, and they need to offer an experience that is a clear alternative to the college experience. [italics in original.] (Boyer Commission 1998: 7-8)

In addition, the 2002 Greater Expectations National Panel Report from the Association of American Colleges and Universities stressed the importance of students graduating from college having honed their ability to make strategic decisions in complex futures. That panel declared that the ability to negotiate multiple perspectives is an essential part of college education:

> The panel recommends that colleges and universities place new emphasis on educating students to become intentional learners. …Intentional learners are integrative thinkers who can see connections in seemingly disparate information and draw on a wide range of knowledge to make decisions. …Higher education has traditionally sorted … knowledge into disciplines, each of which uses distinctive modes of inquiry that shape the way it sees the world. [But] self-aware, informed learners understand the value of multiple perspectives in gaining a complete picture. [Their] college education favors studying about significant, challenging issues as a way to hone intellectual and practical skills.
> (Greater Expectations, AAC&U, National Panel Report 2002: 21-23)

The interdisciplinary collaborative teaching already provided at the University of Michigan meets some of this need, although few of our collaborative teaching ventures yet involve faculty from professional schools. Much of the information we have on the success of these ventures comes from The Center for Research on Learning and Teaching (CRLT), which has contributed grants to faculty for initiating undergraduate interdisciplinary collaborative courses, funding four teams per year since 1998. Through this program, the Interdisciplinary Faculty Associates, faculty document their teaching goals, methods and course outcomes, with special attention to the impact of the interdisciplinary collaboration. The student learning outcomes have been dramatic, with students addressing intricate questions, learning multiple skills in one class, negotiating complex differences, typically learning to work collaboratively with one another, and always dealing with a team of faculty who share authority. Faculty assessment of their students' development details acquisition of analytical skills, capability to address questions they never imagined before, and learning to value and share working with others *because of* differences in knowledge and orientation not despite those differences. A typical assessment of success credits both the collaboration of faculty and that of students. The following comment about their students was made by an interdisciplinary team including one faculty member from a professional school and another from LSA:

In their discussion and writing, the students aggressively sought to blur distinctions between disciplines, or at least willingly engage questions from the vantage of another discipline. … All students seemed genuinely open to cross-disciplinary discussion and criticism and clearly benefited from the hybrid makeup of the class.
(- from course portfolio)

Student assignments, from readings and other materials, to the kind of work done in class, reflect the co-operating of two faculty, the intersecting of different perspectives on teaching as well as on the general questions of the course. Examples of students' work and commentaries, selected by faculty to represent different levels and trajectories of students in their courses, reveal improvement, pitfalls, discoveries, the rewards for working through problems. And student evaluations comment on the interdisciplinarity of courses, recognizing the value of having more than one professor. Students assess their work with phrases that recognize the efforts of the collaborating faculty:

> "You begin to see that the creative possibilities are endless …& that in itself is a benefit & a challenge."
>
> " I benefited from … the productive tension between the two instructors."
>
> This class crackled with fun, conflicting, new and different energies. I've never had a class quite like this one. [The instructors] are such a wonderful team… .
>
> (- student comments are from evaluations or journals included in different course portfolios; underlining in originals.)

And they frequently mention the value of their collaborative work with other students.

> This was a great class, it was very multi-layered. I learned a great deal, especially … working together with [other] people.
>
> The interdisciplinary aspect of this class … gives the opportunity to work with many different people of different backgrounds. …The class was very dynamic.
>
> (- student evaluation comments included in different course portfolios)

While these results are not systematic, they do corroborate the value that is placed on interdisciplinary collaborative teaching by scholars in the field. Carolyn Haynes, past president of the Association for Integrative Studies, notes,

> Interdisciplinary pedagogy … is not synonymous with a single process, set of skills, method, or technique. Instead, it is concerned primarily with fostering in students a sense of self-authorship and a situated, partial, and perspectival notion of knowledge that they can use to respond to a complex questions, issues or problems. (Haynes 2002: xvi)

D. VALUE OF LINKING INTERDISCIPLINARITY WITH TEAM TEACHING

Interdisciplinary study and team teaching are each valuable areas for administrators seeking improvement in undergraduate education. However, the relationship that can exist between interdisciplinary study and team teaching is not an automatic one; many individual faculty members could teach courses from a interdisciplinary perspective, and some UM faculty collaborate effectively within their own discipline to explore issues

particular to their field within the classroom. With this knowledge, the task force has chosen to discuss the two concepts together based on the conclusion that their combination provides ***maximum leverage*** of the resources within the university. We place a high value on students acquiring the ability to articulate, integrate, and negotiate multiple perspectives, to do so with guidance, and to learn from the examples of working with experts who also must negotiate such differences. Thus, *the real value-added to our pedagogy will come from the collaboration of faculty from different disciplinary traditions.*

For students, the benefits can affect the entire undergraduate experience. Our undergraduates take a broad-based curriculum, and a crucial part of their education is the connecting of disparate knowledge through threads and streams. Collaborative interdisciplinary teaching models ways of making these connections, and stimulates students to make them, so that undergraduates benefit in ways that can affect the value of their education as a whole. And since collaborative work characterizes not only many research ventures, but most employment as well, faculty who teach together model intellectual and logistical collaboration for their students, thus training them for their future endeavors.

Collaborative interdisciplinary teaching can also show students how to interrogate the intellectual and rhetorical authority of faculty members, and demonstrates that questioning is central to scholarly activity and to the production of knowledge at all levels. This modeling has different impacts at different stages of students' intellectual development, promoting inquiry and the ability to launch arguments at earlier stages, and then cultivating nuanced engagement with subject material and colleagues at later stages of an undergraduate's education.

There is also much for faculty to gain from such interdisciplinary collaboration. UM has already seen the benefit of interdisciplinarity in myriad research teams across the university. Often, these are teams that could not successfully explore the issues under investigation without the contribution of multiple faculty from different units. Some of these research teams have already evolved into teaching partnerships, with faculty members eager to share their new discoveries with students. We want to encourage the potential teaching collaborations that can emerge from research collaborations. And we want to encourage faculty to explore areas of inquiry with colleagues whose interests coincide, but with whom they are not formally research partners. In addition, faculty sometimes seek out co-teaching ventures precisely because of the opportunity they present to collaborate intellectually with colleagues. Faculty learn from one another on multiple levels: course content, pedagogical approaches, classroom interaction styles (cf. CRLT Interdisciplinary Faculty Associates data 1998-2004). And faculty who meet with other co-teaching teams, and who draw on support of colleagues and pedagogical consultants, praise these interactions' development of their teaching (Ibid). In short, faculty involved in collaborative teaching extol the intellectual stimulation of these ventures, affirming the value in such collaborations not only for students, but for the faculty as well (cf. Lattuca 2004).

E. INVOLVING PROFESSIONAL SCHOOLS IN UNDERGRADUATE EDUCATION

An animating factor in both the generation and work of the task force was the desire to increase the involvement of faculty from the professional schools in undergraduate education. Taking our cue from the President, the task force wishes to emphasize the wonderful opportunity we have to utilize the intellectual resources located in these schools in the fulfillment of our mission to undergraduates. We believe there are faculty in the professional schools who desire to participate—for a variety of reasons—in the teaching of undergraduates. To ensure this intellectual energy does not go unused, the task force wishes to stress that the university should not only do all it can to remove administrative and financial barriers, but also provide those faculty with the inclination to do such work with the support to undertake it.

The task force fully recognizes the complexity such arrangements present to academic deans who must negotiate issues of compensation, incentives for tenure, and course coverage. While resolution of such issues is difficult, we believe the potential benefits make this an important goal to which the UM should aspire. Among the potential benefits accruing to the university, such collaborations would integrate the professional schools into the larger undergraduate teaching mission of the UM and make them less of 'islands unto themselves.' Also, it has the advantage of offering undergraduate students contact with top faculty whom they might otherwise never be able to meet, and provides these faculty contact with the somewhat more enthusiastic undergraduate students, who will often be open to exploring career options available in the professional field. As more and more students with 4-year college degrees from top universities expect to pursue professional degrees at a later stage in their career, this gives them some expectations and information about the topics and faculty such professional degrees might provide.

Still, this goal is not without complications. First, there are obvious funding issues. Professional school faculty are often higher-priced and (sometimes) have lower teaching loads. It can be difficult for undergraduate units to buy out the time of professional school faculty, while the professional schools may have difficulty identifying someone to replace that lost faculty effort due to the expertise required. We believe that the recommendations in this report can speak to the issue of appropriate compensation between units and some level of standardization across units. Second, if such teaching crosses unit boundaries (i.e., a law school professor teaches an LS&A -listed course), there are administrative (as well as funding) barriers that might have to be negotiated. Few professional schools may want to (for instance) teach the courses that LS&A wants. They will want intellectual (and possibly administrative) control over these courses. They are typically used to providing more 'community services' (i.e. higher cost/student) and may want a different model for teaching than at least some undergrad units on campus provide. In addition, professional school faculty may have less time to become acquainted with pedagogical techniques that enhance the experience of team-taught courses for students.

Third, the task force recognizes that not all professional faculty welcome such an initiative; they are in professional schools because they have selected to work only with graduate students. That is why the goal must be to facilitate the efforts of those

professional school faculty that wish to make undergraduate teaching part of their instructional work. This also involves ensuring that professional school faculty are not punished in the tenure and promotion system for having worked with undergraduates. Safeguards could include protection of faculty time from excessive effort in team teaching—given that these courses are time-intensive—as well as some recognition for innovative teaching practices. Finally, professional schools might feel this is somewhat marginal to their core functions, and thus will not be willing to invest lots of money and time into such an initiative. For these reasons, the task force members believe that the best approach for identifying, developing, and sustaining such initiatives is a "bottom-up" approach, whereby the individuals and units that wish to engage in such teaching efforts can find administrative and financial support, with the hope that the growth of such efforts can serve as models and the impetus for others.

Beyond individual courses, there are two models for professional school involvement in undergraduate teaching. Professional schools (without undergraduates) can partner with an undergraduate school or department that has undergraduates to offer some cross-listed courses. At a minimum, this would expose students to instruction by faculty from other units, and such partnerships could produce team-teaching partnerships between faculty. Alternatively, professional schools could initiate undergraduate programs within themselves. This gives them control to shape a curriculum and solves many of the funding/administrative issues. But such programs must be closely coordinated with the other undergraduate programs across campus, while background research and feasibility studies can help schools determine the balance between potential costs and benefits. Any of these approaches can work in the appropriate context, and it is the belief of this task force that proper support from the Provost could facilitate these efforts.

F. THE UNIVERSITY OF MICHIGAN CONTEXT

The work of this task force is directed at the University of Michigan. Its findings concern the current environment at UM and its recommendations seek to advance team teaching and interdisciplinary learning at UM. In considering possible recommendations, we gave high priority to those that took advantage of particular strengths of UM and gave lower priority to those that fit poorly within our institutional context. It is worth recording some of the characteristics of the University of Michigan that were important in shaping the findings and recommendations that we make in this report. Some of these are characteristics of a research university, some are characteristics of a public university and some are unique to the traditions and structure within UM.

a. *Broad Expertise*: The University of Michigan is a comprehensive research university. No matter what the academic subject, there is likely to be an expert on that topic on the UM faculty. Consequently, we are particularly well-positioned to mount courses on complex, multi-faceted topics.

b. *Capacity to Support Intergenerational Teaching*: Being a major public research university, the University of Michigan has large cohorts of talented individuals at each stage of their academic careers: faculty, post-doctoral fellows, graduate students, upper division undergraduates and lower division undergraduates. Therefore, we

have the human resources necessary to support instructional teams that cross academic generations.

c. *Existing Collaborative Networks*: The University of Michigan prides itself on the level of interdisciplinary research that goes on within the University. Very often, this research is accomplished via collaborations of faculty from different units and disciplines. These existing research networks can serve as the basis for the creation of cross-unit instructional teams.

d. *Graduate and Professional Schools*: A distinctive feature of the University of Michigan is the breadth and strength of its graduate and professional schools. Faculty in these schools are an important asset that we can bring to bear on undergraduate instruction. Faculty in graduate and professional schools are closer to their professions and so bring a perspective to the classroom that is complementary in some respects to the perspectives brought by basic research faculty in undergraduate colleges. Moreover, several of the graduate and professional schools are in topic areas that are closely aligned intellectually to areas of intense undergraduate interest (and therefore undergraduate enrollment).

e. *High student-faculty ratios*: The University of Michigan is a public university with a mission to provide education and access on a broad scale. In keeping with that mission, the University supports a substantial undergraduate enrollment of around 25,000 students which creates high student-faculty ratios in our undergraduate colleges. So, priority must be given to team-teaching options that serve large numbers of students or that bring to bear new sources of instructional staffing, such as increased engagement of graduate and professional faculty or intergenerational instruction that involves advanced undergraduates or graduate students in new and innovative ways.

f. *Decentralization*: A long-standing institutional characteristic of the University of Michigan is its decentralized structure with significant authority for curriculum, budget and planning resting with the schools and colleges. Although this decentralization is in many ways a strength and an asset for the institution, it presents challenges when trying to support team teaching activities that involve faculty and students from several schools and colleges.

g. *Top-down and bottom-up:* The University culture is very entrepreneurial; as a decentralized institution, U-M relies on both top-down initiatives from the central administration and the deans, as well as bottom-up initiatives from individual faculty. The CRLT Interdisciplinary Faculty Associates program, with faculty-initiated individual courses, represents an example of the latter. Faculty consider it important to have funds and support available for their own initiatives, just as they rely on central administrators to fund major new initiatives like the one proposed here.

h. *Little spare faculty effort*: The professional lives of University of Michigan faculty members are very full. Most are highly engaged in their professional work and have

opportunities to pursue high value activities in a variety of arenas including instruction, research outreach, internal and external service. For most faculty members, there are many more high value activities that they would like to pursue than they have time for. This observation is particularly relevant if there are administrative barriers to team teaching. Faculty members who are contemplating a team teaching effort but run into an administrative obstacle, are as likely to turn their attention to some other highly valued activity. Therefore, it is crucial that we make efforts to remove unnecessary administrative barriers to team teaching.

G. BARRIERS TO TEAM TEACHING AT MICHIGAN:

A theme that our Task Force heard consistently from faculty over the past year was their frustration at having run into barriers that prevented, or made more difficult, their efforts to launch and sustain team teaching initiatives. Some are challenges faced by any undergraduate instructor, but exacerbated by the complexity and demands of collaborative teaching. Others are unique to the team teaching situation.

CRLT has also studied barriers to collaborative instruction and devoted one the Provost's Seminars on Teaching to the topic in 1998. As part of that effort, CRLT compiled an extensive list of obstacles that UM faculty reported as ones they face in their team teaching efforts. The complete list from this CRLT effort appears in Appendix III.

The set of barriers reported to our Task Force is highly consistent with the ones compiled by CRLT. Below is a list of barriers and issues that was synthesized from these two sources. We have divided the list into five subcategories – Resources, Information and Expertise, Rewards, Administrative and Bureaucratic Issues and Student Issues.

Resources:

Teaching efforts that involve multiple faculty or combine multiple disciplines are complex by nature. Some models of team teaching lead to multiple instructors teaching a small to moderate number of students, thereby lowering the overall teaching capacity of the UM faculty. As compared to a discipline-centered course with a single instructor, team teaching across disciplines requires more time and energy for intellectual and logistical planning, as well as greater development of new course materials. Challenges cited in this category include:

- Garnering sufficient resources to fund the intensive start-up phases of the course.
- Finding financial resources to buy out faculty from other departmental teaching and the need for the department to identify faculty to replace that lost teaching effort.
- In more complex initiatives, the need for faculty resources to play a coordination role during the set-up and running of the course.
- Moving a course to a sustainable support model after an initial period of start-up funding.

Information and expertise:
Team teaching is outside the normal mode of instruction for most faculty, so there is much to learn about the experience. Currently, most faculty do not know where to find information and advice about team teaching and interdisciplinary learning that they need to succeed in this endeavor. Faculty need to know about the pros and cons of different models of collaborative instruction and different methods of evaluation, and they need to have a platform to exchange information about their experiences and offer advice for new instructors.

The Reward System:
Amongst research universities, the University of Michigan is an exemplar in the degree to which it values and rewards collaborative and cross-disciplinary activities. Despite the tradition of support that such activities have at UM, a number of faculty members have concerns that engagement in such activities work against an individual within the institutional reward system. Specific perceptions tied to teaching activities include:

- Team teaching efforts carry particular risk for junior faculty in two ways. First, team teaching tends to be time intensive and divert effort from development of a research program. Second, collaborative teaching initiatives require a great deal of start-up effort and their outcome is unknown. So, a junior faculty member may expend a great deal of effort without being able to show a commensurate amount of success for his/her tenure case.
- Because it is difficult to evaluate the distinctive contributions made by team teaching, such teaching efforts are not adequately recognized and rewarded.
- Departments place greater value on teaching done within their disciplines, particularly when there are issues covering the department's core undergraduate concentration courses.
- The University places greater emphasis on and provides greater rewards for interdisciplinary research than for interdisciplinary teaching.

Administrative and bureaucratic issues:
Team taught courses and interdisciplinary programs have particular bureaucratic and administrative complexities. On the administrative side, course leaders have to align the efforts of multiple instructors. On the bureaucratic side, such courses and programs are often supported within multiple units and have to navigate the requirements of those units. Specific concerns that were articulated by faculty include:

- Which unit has ultimate responsibility for the course or program? How is credit for teaching the courses split between the participating units?
- Faculty instructors often need assistance with course administration and those resources may not be available within any of the participating units.
- Different units (particularly different colleges) have distinctive cultures around teaching effort and contribution. This can lead to misaligned expectations between faculty and administrators about workload, level of contribution and level of compensation.
- The geography of the campus can complicate course logistics.

- There is not an effective means for faculty to share information about experience with administrative and bureaucratic barriers – what to expect and effective strategies for overcoming these barriers.

Student issues:
The issues outlined above have focused on barriers that faculty and administrators encounter with team taught courses and interdisciplinary courses. But the complexities of working across disciplines also impact the student instructors and enrolled students. Challenges related to students include:

- Interdisciplinary courses attract students with a greater disparity of backgrounds and interests than do disciplinary courses because students attending an interdisciplinary course may hold a particular interest in any of the disciplinary areas represented by the course. How to set course goals to accommodate these differences?
- Desired learning outcomes may differ in fundamental ways between the units that are partnering on a team-taught course or interdisciplinary program. For example, one unit may emphasize development of abstract problem-solving skills whereas the other may emphasize learning outcomes defined by a specific knowledge base and set of technical skills.
- Often, courses with interdisciplinary content do not fit well within degree programs and are not designated to fulfill graduation or distribution requirements within the participating units. This can create obstacles for students who try to fit these courses within tightly structured degree programs. There are other types of challenges associated with designating interdisciplinary courses for graduation and distribution credits. One type of difficulty arises when the course content does not cleanly fit the categories associated with distribution credits. Second, it is a challenge for faculty and staff involved in cross unit courses to learn about the processes and rationale for distribution and graduation designations within the other participating units. It is a challenge to market interdisciplinary courses to undergraduates. They do not necessarily recognize the value of working across disciplines.

Some of the barriers outlined above are unavoidable because they derive from the nature of our institution and its ambitions. For example, every department chair or dean, no matter how dedicated they might be to team teaching, will sometimes be forced to require a particular faculty member to defer a team teaching activity because they need that faculty member to staff a crucial departmental course. Other barriers are ones that the institution can lower. A number of times, our Task Force heard of instances whereby a team teaching effort was made less effective or more complicated because the faculty members involved had difficulty tapping important information about team teaching templates, methods of evaluation or information about school and college requirements.

As noted in an earlier discussion of the University of Michigan context, faculty members at Michigan can pursue a wide variety of valuable activities. When faculty encounter a barrier in the course of launching a team teaching effort, particularly a barrier that they find unnecessary or unreasonable, they are likely to turn their attention to some other high value

activity. So, a high priority for our Task Force has been to seek solutions that lower barriers whenever possible.

2. OPERATIONAL FACTORS

A. EXISTING COURSES AND PROGRAMS

As a first step, it is worth taking stock of what is currently in place at the University of Michigan. We begin with team-taught courses and use the academic year beginning in September of 2003 as our sample. In that academic year there were 14,800 organized course sections mounted across the University, not counting independent study and dissertation research. Of those, 442 sections (around 3%) were taught by two or more tenure-track faculty, each working 10% or greater effort on the section. These team-taught sections were fairly evenly divided between the undergraduate and graduate levels with 247 occurring at the 100-499 levels and 195 occurring at the 500-799 levels. Also of note is that 32% of the team-taught sections featured faculty from different departments and programs. A complete breakdown of this data can be found in Appendix VI.

The University of Michigan is home to a number of thriving interdisciplinary undergraduate degree programs. Examples include concentrations such as Women's Studies, American Culture, Industrial Design and Urban and Regional Planning. Note that these programs reside within undergraduate schools and colleges as opposed to across schools and colleges, a point that we will return to later.

There are formal programs in place to support development of team-taught courses. Of particular note is the CRLT Interdisciplinary Faculty Associates (IFA) Program which provides support to four new team-taught courses each year. The innovations supported by the IFA Program consist primarily of small to moderate sized classes taught by two or more faculty, but lecture courses with enrollments numbering between 75 and 200 have also been funded. This program is in its eighth year; a list of recent recipients of support under this program appears on the CRLT website. The support provided by the Faculty Associates Program includes limited funding (around $10K per course) along with consultations provided to the faculty teams, and a year-long seminar where the four teams come together to discuss their teaching and their course portfolio documentation. These Faculty Associates note that the support framework is of particular value, often of greater value than the financial support. Historically, most course proposals to the IFA Program have come from the Arts, Humanities and qualitative Social Sciences.

A second funding program for team-taught courses was connected to the University's Life Sciences Initiative. This program provided support to launch a series of new, interdisciplinary courses in subjects related to the life sciences. The support provided for each course was substantial and included buying out faculty time for curricular development, GSI support for the courses, lab materials etc. The resulting courses were innovative and exciting but failed to identify a path to sustainability once the initial

funding was expended. Although there are efforts underway to identify ways to sustain a couple of these efforts, these courses have largely been abandoned.

Development of interdisciplinary degree programs and more complex team teaching efforts is most often supported by individual schools and colleges and done within the context of college planning. Currently, there are no University-wide programs to support development of large-scale team-teaching efforts and degree programs. Such initiatives are often driven by and supported on an ad hoc basis from a variety of provostial, school/college and external sources.

B. EXISTING MODELS & TEMPLATES

The history at UM of undergraduate degree programs shared across Schools and Colleges is limited. The task force found several models for team teaching and interdisciplinary programs, some of which seem to fit the criteria of the task force and have worked well in practice.

As noted earlier, there are a number of highly successful interdisciplinary degree programs currently in place at the University of Michigan. Amongst these, however, there are relatively few instances of undergraduate degree programs that are shared by two or more schools and colleges. At the graduate level, the Rackham IDP provides a well-developed mechanism to support cross-unit programs and a number of excellent programs exist. However, there are a number of factors that complicate cross-college degree programs. The programs that do exist tend to be either a) models in which a student does her pre-concentration coursework in an undergraduate college before transferring (usually in her junior year) into the degree program hosted by a graduate college or b) models in which the degree program is operated by an undergraduate college which hires faculty instructors from other schools and colleges. These programs fall short of true sharing. The Bachelors of Business Administration and Architecture degrees are examples of the first and the Program in the Environment is an example of the second.

There currently are several models of team teaching at U-M, almost all of which have been initiated by faculty:

- Existing collaborative courses where faculty with related expertise co-plan and co-teach large courses (e.g. History and German 317 or 322 on the Origins of Nazism) or smaller ones (e.g. 300- or 400-level Special Topics courses).
- Integrated lecture courses in which the curriculum is planned and coordinated by a single faculty leader and with faculty from different units delivering portions of the course, e.g., the Global Change course.
- Meet-together courses in which two or more separate courses on related topics are scheduled at the same time, with the courses occasionally holding joint sessions, e.g., Psych 416 and American Culture 416 on the Psychology of Asian-Americans.
- Intergenerational apprentice models in which single courses have instructional activities shared among faculty, graduate students, and /or post-doctoral students, and

advanced undergraduates, e.g., dialogues courses in the Program on Inter-Group Relations, and the Honors sections of Chemistry 210 and 215.

- Learning communities, which are small groups of students and faculty members who work together around a set of common intellectual interests, have multiple opportunities to interact inside and outside the classroom, and most of them are based in a residence hall, e.g., Health Sciences Scholars Program (HSSP).

(See Appendix V for more details on these models of team-teaching and interdisciplinary programs currently in place at UM. See Appendix VI for models existing in the literature.)

C. IDENTIFYING ACADEMIC AREAS FOR TEAM TEACHING ACTIVITIES

The work of this task force most directly addresses modes of instruction as decisions on curricular matters, including areas for development and emphasis, should be made by the faculty in the different schools and colleges. Choice of curricular area is crucial to implementation, however, thus we recommend some general attributes as criteria for developing interdisciplinary degree programs or courses that are team-taught.

First, intellectual areas most suited for team teaching are those with complex topics that are most successfully studied with a combination of different perspectives. Second, it should be a lively scholarly area, with significant activity at UM, especially those that involve research collaborations that cross boundaries between units. Third, the subject should have intellectual cohesion and the potential for an integrative framework. Fourth, topics in this area should engage undergraduate students because of the interest and benefits provided.

Drawing on faculty who collaborate in research is not necessary for the success of all team taught courses. (In fact, some faculty enjoy collaborative teaching because they do not otherwise have the opportunity to work directly with one another on research.) However, research collaboration is a valuable foundation for complex initiatives such as suites of courses, programs of study or large courses involving a number of faculty. In order to involve the breadth of university resources in undergraduate education, and to involve faculty graduate and professional schools and colleges, prior collaborative relationships may make the process of teaching together much easier. In these large-scale contexts, a large number of faculty must engage in instructional activity in a coordinated and cooperative manner. Faculty teams who are engaged in collaborative research efforts have already formulated a working relationship, and know something of each other's scholarly perspectives, which are powerful assets in constructing new curricula.

D. ADMINISTRATIVE STRUCTURES & MECHANISMS

As new courses and programs cannot survive without dedicated administrative support, we recommend a structure that will foster development of new degree programs and large-scale courses, and enhance development of smaller scale courses, to reach a large number of undergraduates. Such a structure should not be a major apparatus, however, at least at this point in the development of interdisciplinarity at U-M. It should be a

structure that serves a supportive and coordinating function, given the decentralization that inheres in the University's curricular decision making. As interdisciplinarity grows, however, it may be appropriate to vest a larger structure with administrative responsibilities. Appendix VII presents three models of administrative structures that are successful at other universities and may be appropriate to support and encourage collaborative teaching efforts at the U-M at a later time.

What is possible in the short run, to maximize the impact of interdisciplinary initiatives, is to support and extend a support network, building on existing programs and activities. Aspects of this coordination can be undertaken by a "point person" in the Provost's Office, and by a Steering Committee of faculty and administrators. Much of the coordination should be provided by the units with the needed expertise, including those following.

- CRLT/ Faculty development
  As a leading center of its kind, current CRLT activities such as incentives for the development of team-taught courses as well as faculty development and support could be expanded in the service of generating more interdisciplinary courses and fostering more cross-unit collaboration. Furthermore, CRLT could be supported in offering more interdisciplinary forums such as colloquia, seminars, and other opportunities for faculty to gather to explore new methods of inquiry and teaching.
- Undergraduate Academic Advising
  An emergent problem with new course offerings is finding their place within the curricular requirements of the schools and colleges. If standardization in the procedures for course development can be achieved, the purposes of courses and their fit within requirements can be better established. Overcoming problems of advising/communication would help advisors and students make more informed decisions about courses.
- Freshmen-Sophomore Interest Groups & Residential Living-Learning Communities
  Interdisciplinary and team-taught courses can be offered as part of self selected interest groups and learning communities. These programs already offer support and interaction with faculty inside and outside of class. UM could build on these programs to offer collaborative courses in more academic programs.

E. EVALUATION

Evaluation of these innovative courses and programs is critical to determine whether (and where) the University is allocating resources effectively. However, interdisciplinary collaborative teaching takes considerable time & effort, more than other teaching, so it is important not to add substantially to the workload of instructors engaged in these innovative pursuits. What follows is a menu of ways to evaluate interdisciplinary team-taught undergraduate courses. Whatever the methods selected, evaluation processes should support faculty involved not overburden them.

Evaluation should focus on the following: student learning outcomes, the success of specific courses and teaching collaborations, and the benefits of the program as a whole in both the short and long run. Student success should be the foundation for other

successes, and evaluation at all levels should be flexible enough to allow for collaborations that are unusual in structure. Existing modes of course evaluation (student ratings, in particular), are not in themselves nuanced enough to examine the complexities of interdisciplinary teaching and learning. Faculty have their own systems for evaluating student work, and they should use their own goals for student learning as the test of their success in teaching. The program should expect results from all investments, but cannot expect to develop standard measurements for these courses.

Documenting teaching goals, strategies, and learning outcomes

Documenting course goals, teaching strategies, and student learning outcomes will maximize the impact of investments in interdisciplinary teaching and learning. No thorough reporting or analysis can be expected, but documentation of these key elements can ensure that faculty do not have to reinvent their approaches to interdisciplinarity and collaborative teaching. A course portfolio is a form of documentation that has proven to be useful in the CRLT Interdisciplinary Faculty Associates program, for it is a form that can be adapted to the uniqueness of courses that are formed each time a team of faculty teach together, and it is focused and brief enough to be useful to others. By writing course portfolios, faculty often become aware of implicit goals that underlie their course designs. They also become more attentive to the ways in which they see students differently. And exchange among faculty teams is enlivened by the shared challenge of documenting their teaching. Course portfolios can also contribute to the pedagogical resources of the faculty as a whole when they are posted on a university website.

Evaluation of the Collaborations

Faculty should also evaluate their collaborations, in terms of their teaching outcomes, their satisfaction with the teaching experience, and the value of the collaboration to their professional development as teachers and scholars. Their commentaries on the collaborations can be incorporated into course portfolios, so that what they learned can be useful to others.

Evaluation of the Programs

Evaluation of the programs should be made in terms of the contributions to University teaching. One component will be the number and scope of courses initiated and sustained, their ability to engage faculty from across the university, and the number and diversity of students taught. A second will be the documentation produced that serves others who develop team taught courses. A third component involves compiling results on the course level, particularly in terms of student achievements in the first course offering and beyond. Fourth, satisfaction of faculty and students with support structures should also be assessed, along with appraisal of the impact of funding and support provided. Finally, faculty including deans should provide regular feedback on the contribution of the program to the goals of the Schools and Colleges, and to departmental goals.

Long-term impact on students

A final dimension of evaluation could be to track student success after taking an interdisciplinary collaboratively taught course. Students participating in large courses could be tracked to determine their subsequent successes in courses, and could be contacted after graduation to determine what they say about how these courses contributed to their future work and schooling. An even more ambitious undertaking would include contacting faculty who teach these students as seniors to determine if their analytical abilities stand out at that time.

Additional ideas for course and program evaluation can be found in Appendix VII.

3. VISION FOR CHANGE

A. SUMMARY OF FINDINGS:

Our recommendations are guided by the findings and observations that appear in earlier sections of this report. To place the recommendations in proper context, it is worth highlighting some of the findings that have been important in formulating the recommendations to follow.

There are opportunities both to actively stimulate new team-teaching initiatives and to lower barriers that currently impede launch of team teaching or interdisciplinary teaching initiatives. To achieve maximal effect, the University should follow both approaches. The CRLT IFA Program offers an effective model for the support of single team taught courses. However, it would be desirable to broaden the scope of the program. Currently, there is no institution-wide mechanism to support initiatives that are more complex such as cross-unit degree programs or high enrollment team-taught courses involving multiple faculty from different schools and colleges.

Several considerations should go into the design of a program to stimulate the launch of new initiatives. It is appropriate to front-load funding for an initiative to support development of materials and perhaps the first year or two of course offerings. In developing and sustaining a team teaching effort, there is substantially more work in the initial stage when the course is developed and when it is offered for the first time. As the course is repeated, the workload diminishes. Support for team-teaching efforts should follow this workload trajectory: substantial support to develop the course and teach it the first time followed by diminishing levels of support as the course is taught more often. However, initiatives that have not identified a path to sustainability are likely to fail when the period of initial funding expires. To maximize the chances that an initiative achieve long-term sustainability, two important considerations are that the teaching model fit well within the UM context and that the initiative aligns well with the plans and priorities of the participating schools and colleges.

Institutional support for team teaching and interdisciplinary learning should play to the strengths of UM and fit within its context. There are multiple models for team teaching;

some take greater advantage of the features of and are more sustainable within the UM context. Those models should be given priority for incremental support. We have identified those that work particularly well at UM. The CRLT Interdisciplinary Faculty Associates program, for example, provides the small-scale support for faculty-initiated undergraduate team-taught interdisciplinary courses that faculty expect to find in the University's entrepreneurial environment. Just as some models of team teaching fit particularly well within the UM context, some areas of study will better support interdisciplinary degree programs at UM than others. Given resource limitations, team-taught courses that require substantial subsidies to be sustained do not fit well within the UM context.

There are multiple organizational features at UM that complicate cross-unit collaborations. For example, under current practice, undergraduate degree requirements are set by Colleges, undergraduate student support infrastructures are housed within Colleges, and the mechanisms to insure academic standards and quality reside within Colleges. This does not allow for collaboration and shared planning and design of courses, and their place within the larger curriculum. Also, the University budget model assigns undergraduate tuition to Colleges and in two pieces – one assigned to the unit of enrollment and one assigned to the unit of instruction. More flexible options to share tuition revenue could better facilitate collaboration between Schools and Colleges on degree programs.

Administrative structures and policies create disincentives for faculty to participate in team teaching. Because team teaching and the development of new courses often require a greater time commitment than teaching a standard course, some junior faculty may be professionally disadvantaged by participating in interdisciplinary courses. For an untenured faculty member in a large research university like UM, time and energy spent developing new and innovative courses is time and energy taken away from the research portfolio that will be pivotal in determining his or her academic future. However interested and capable an assistant professor may be in creating new courses, unless specific incentives are offered, new faculty (who often have some of the most cutting-edge expertise) may be discouraged from full participation in curricular development.

There is considerable opportunity, and pent-up demand, to launch more complex initiatives: those that involve complicated pedagogical structures or participation from multiple units, especially multiple schools and colleges. We note that there are a few highly successful examples of such activities in place at present and we encountered abundant desire to add more. Complex initiatives that impact high enrollment courses have the advantage that they often expose pre-concentration students to interdisciplinary learning. Activities which bring the expertise of graduate and professional faculty to bear on undergraduate education seem particularly underdeveloped (relative to interest, ideas and potential student impact). Such initiatives take advantage of the University's strong professional schools and the interconnections between faculty that have resulted from the tradition of interdisciplinary research at the University of Michigan.

In addressing barriers to team teaching, we have focused on mechanisms that make it easier for faculty to move forward from an initial concept to an operational course. A pressing need is to make information and advice more easily accessible. Many interesting and ambitious initiatives in team teaching and interdisciplinary learning have been launched at the University of Michigan and we should offer lessons learned from those experiences to faculty who engage in new efforts. Faculty should be able to easily tap the wealth of institutional knowledge about possible models of team teaching, about how to evaluate success of an initiative and about how to ensure that courses are designated for the appropriate distribution credits. There should be recommended norms for compensation of faculty who are engaged in cross-unit instruction so that each initiative does not involve local negotiations between faculty, chairs and deans. Lastly, there are almost no examples of undergraduate degree programs that are truly shared between schools and colleges. It is perceived by many that the incentives built into the University Budget Model constrain flexibility in this area.

We feel that there are particular opportunities to develop interdisciplinary, cross-unit degree programs at the University of Michigan based on faculty interest in such programs and the benefit that they could bring our students. In several areas of pressing undergraduate student demand, there are closely aligned graduate and professional schools. These areas represent significant opportunities to develop distinctive undergraduate degree programs run collaboratively by graduate/professional schools and undergraduate schools. For such programs to be of optimal benefit to UM, these collaborative programs should absorb some non-trivial amount of the student credit hour burden in the academic area. We endorse the notion that undergraduate degree programs should reside within an individual school or college, even if two or more colleges collaborate on the degree program. The school or college hosting the degree holds primary responsibility for setting academic requirements, ensuring academic standards and providing student support. Within that framework, there is opportunity for collaborative degree programs between schools and colleges in which curriculum development, instruction, costs and revenues are more truly shared. We feel that this is an underdeveloped area at the University of Michigan to the disadvantage of our students and faculty. Our recommendations include steps to stimulate development of such programs and to remove barriers to their success (particularly barriers that result from the University budget model).

With these points as context, we now state the major recommendations:

B. RECOMMENDATIONS OF THE TASK FORCE:

Recommendation 1

The University should launch a major funding program to support complex initiatives that incorporate team teaching and interdisciplinary learning in undergraduate instruction.

This recommendation responds directly to our finding that the expansion of complex initiatives is a particular area of opportunity. We envision that this funding program will have broad reach across the undergraduate colleges and will support some initiatives that are joint between undergraduate colleges and graduate and professional schools. So, we recommend that the Provost's Office administer the program. Although implementation details should be left to the Provost's Office, we would like to offer guidance on several aspects of the design and administration of the program.

a) The program should have a steering committee, composed largely of faculty that will play an active role in making funding decisions.

b) An important criterion for support of an initiative is that it fit well with the plans and priorities of the units involved, at the department/program and at the school/college levels.

c) The Program should take steps to encourage proposals that test innovative models of instructional partnership between graduate/professional schools and undergraduate colleges.

d) Successful proposals must make a convincing case that the initiative can be sustained. To make such a case, the proposal must be attentive to factors that support sustainability. One such factor, mentioned earlier, is the degree to which the initiative fits within the UM context. Other factors are operational. The proposal should indicate that sufficient thought has been given to detail and design of the initiative. A plan should be presented for renewal of faculty who will teach in and champion the initiative. The proposal should make a convincing case that the initiative will attract strong enrollments. Lastly, proposals should identify a plausible path to financial stability following a period of start-up funding from this program. At steady state, the schools and colleges involved in the initiative should be expected to contribute up to the normal level of support for courses in the particular subject area and at the particular level.

e) Each proposal should include a plan for evaluating success of the initiative. Evaluation plans will depend very much on goals for student outcomes and so proposals should include a discussion of desired student learning outcomes.

f) Because the initiatives to be supported are complex, the Program should be proactive in generating proposals. Ultimately, the ideas and proposals must come up from the faculty who will do the work. However, there a number of ways that the Provost's Office and Program Steering Committee can help to seed ideas and proposals:
   - Through consultation with the undergraduate deans, the Steering Committee should identify a number of priority areas in each year or funding cycle.
   - Once an area has been identified as a priority area, the Program should take active steps to stimulate proposals, perhaps employing tactics that are used by

for this same purpose by federal funding agencies. An example might be the use of "lightning proposals" where different groups of faculty are brought together for a short period to brainstorm on ideas. The most promising of these are developed further through planning grants.

g) The Program should retain a modest amount of its funding for particularly meritorious ideas that may not fit the current priorities or even fit the mandate for complex initiatives.

h) We recommend that this Program be funded for five years with an evaluation of its success early in its final year. By way of goals for this five year period, the Program should seek to support at least three initiatives that lead to new high enrollment courses or course sequences as well as three new cross-unit degree programs.

Recommendation 2

The support model offered by the CRLT Interdisciplinary Faculty Associates (IFA) Program should be enhanced so as to broaden the level of interest and involvement in the Program.

The Task Force recommendations for large scale courses and programs that respond to the priorities of the schools and colleges should not eclipse or invalidate bottom-up, faculty-initiated programs. CRLT's IFA Program has been highly successful in seeding faculty-initiated team teaching efforts. This program supports proposals brought forth by small teams of faculty who share intellectual and creative interests and need support to develop individual undergraduate interdisciplinary courses. The IFA program plays an important complementary role to the funding program proposed in Recommendation 1 that would support more complex initiatives.

The IFA program has been very successful: more than half of the courses developed in the last eight years have been incorporated into the regular curriculum. The intent of this recommendation is to enhance the IFA program so that it will fund more courses, have even more courses become part of the regular curriculum, and attract broader participation (broader in disciplinary terms). This can be done by offering more effective support packages, thus becoming more effective in two ways. One way is to enrich the support model offered by the IFA Program into multi-year packages according to which there would be substantial funding for the first year and then a gradual decline in funding over the next two years, thereby giving new courses a greater opportunity to become established as a regular part of the curriculum. A second way is to broaden interest in disciplinary terms, so that there is greater involvement from the quantitative social sciences, the sciences and engineering. Funding for replacement faculty should be allocated where needed.

Providing support to faculty undertaking interdisciplinary and team-teaching will be key in maximizing the impact of this initiative. In order for U-M faculty not to

reinvent the wheel, CRLT should coordinate an annual seminar or institute in which faculty confer with peers who are involved in similar pedagogical activities, and in which they can formulate proposals for new programs or courses. In addition, CRLT should continue to provide ongoing consultation for faculty teams, assist faculty in documentation of student learning successes, organize a seminar throughout the academic year for faculty teaching funded interdisciplinary stand-alone courses, and offer feedback programs. This support will maximize the impact that the new initiatives' successes have upon one another, and also maximize the impact on student learning. CRLT, as a resource providing information and expertise for faculty engaged in team teaching initiatives, should be prominently featured in the website tool proposed in Recommendation 3.

We recommend a five year support package be provided to CRLT for the IFA Program, to be coordinated with the larger initiatives proposed under Recommendation 1, with the website development proposed under Recommendation 3, and with CRLT's role in developing an annual institute on interdisciplinary collaborative teaching and other support mechanisms for the larger initiatives.

Recommendation 3

The University should put in place effective means to disseminate information and advice that will be of value to faculty who are engaged in team teaching and interdisciplinary learning efforts. Given that this information will be of potential value to faculty across the University, the Provost's Office (perhaps through its reporting units) should take the lead in this effort. Mechanisms for disseminating information that are particularly important to put in place include:

(A) A "point person" to serve as an advocate and coordinator of interdisciplinary collaborative teaching.

The responsibilities for orchestrating a new campus-wide initiative, one that includes both top-down program development and also faculty-initiated course development, will require significant administrative time and expertise. The Provost's Office needs a position (or a significant fraction of a position) for a person who can handle the following:

1) Coordinate the large-scale course and program component of this initiative.
2) Provide advice and support to faculty, Chairs, and Deans, to remove barriers to interdisciplinary collaborative teaching and to encourage participation in the initiatives.
3) Work together with other units, especially with CRLT and with the Advising Offices, to ensure that faculty and students involved in the initiatives receive the support they need.
4) Work with CRLT to ensure that course portfolios, faculty seminars, and the annual institute provide valuable resources to University faculty as a whole, as well as to those participating in the initiatives.

5) Coordinate program evaluation.

(B) A web site dedicated to team teaching and interdisciplinary learning, hosted by the Provost's Office, containing information such as:

1) Pedagogical information and advice for faculty who are engaged in, or are contemplating, team teaching or interdisciplinary learning initiatives. For example, this section should contain templates that describe different models of team teaching and cross-unit instructional programs with an analysis of the strengths and weaknesses of each model, challenges that one might encounter in putting together initiatives and strategies for overcoming them, perspectives on learning outcomes and the student experience, and advice on methods to evaluate the success of interdisciplinary learning activities.
2) A listing of campus resources to support team teaching and interdisciplinary learning including potential funding sources as well as names of individuals who have led highly successful team teaching efforts and can be tapped for advice.
3) A summary of graduate requirements (distribution requirements, etc) for each undergraduate school and college and information about how to request that a course be certified to satisfy each requirement.

Recommendation 4

The Provost should convene a working group to recommend changes to budgetary policy and practice that would reduce barriers or provide financial incentives for team teaching and interdisciplinary degree programs. One specific focus of this group would be to look at opportunities for graduate and professional schools at Michigan to increase their involvement with undergraduate teaching and degree programs. Important topics for this group to consider include the following:

(A) Should there be standards for levels of compensation that a unit should receive when one of its faculty members teaches (or team teaches) a course for another unit?

One of the most-cited barriers to team teaching is the need to negotiate, in each individual case, the level at which the unit sponsoring the course would have to compensate another unit for a faculty member's effort in a course. In many cases, the faculty members themselves become involved in the negotiation with frustration being a common outcome. The intent of offering guidance on compensation levels would be to reduce the amount of negotiation that goes on with each new appointment and allow for better planning of cross-unit instructional initiatives. This recommendation is not meant to undermine existing arrangements which should continue if they are satisfactory to the units involved. But rather, the intent is to provide a guideline for situations where no prior agreement has been worked out.

The underlying question is what percent of a faculty member's work effort goes into teaching a course. In many units, the normal instructional load is four courses per

year. But it would not be accurate to deduce that a faculty member in such a unit puts 25% of their annual effort into each class as faculty members engage in many activities as part of their job besides teaching classes. In particular, they mentor undergraduate and graduate students, advance knowledge through their research, engage in outreach activities and perform governance and service duties at the departmental, college, university and national levels.

We recognize that the level of effort that a faculty member puts into an individual course is highly variable. The proposed Provost's guideline is a budgetary tool that helps units come up with fair compensation based on an approximation of the average effort that faculty members put into teaching courses. We spent some time discussing possible levels of compensation within the task force and with others across campus. One option is to provide the home unit with 16.67% of the faculty member's academic year effort (i.e., 33.33% effort during the semester when the course is taught). This option says that if a faculty member's duties consisted only of classroom instruction, then the standard teaching load would be six courses per year. A second option would be a level of compensation that is 2/3 of the academic year salary divided by the number of courses that the faculty member teaches. In other words, if the faculty member's standard teaching load is 3 courses per year, then the hiring unit would provide the home unit with 2/3 of 1/3 of the academic year salary. These two options coincide if the standard teaching load is 4 courses per year.

The Task Force recognizes that this is a complex issue that is highly relevant to team teaching and interdisciplinary learning but has much broader implications. So we chose not to recommend guidelines but rather recommend that the Provost convene an appropriate group to make recommendations.

(B) Recommend models for undergraduate programs that are shared between schools and colleges. Each model should delineate how curricular roles and responsibilities, costs and revenues would be shared between the participating units.

As pointed out earlier, there are two models currently in place on campus for undergraduate degree programs that are supported by multiple colleges, supported in the sense that faculty from multiple colleges are significantly involved in the instruction required for the degree. Although these models have some real benefits, they also have limitations. In particular, neither of these models leads to a fully collaborative program in the sense that curriculum planning, instructional responsibilities, program costs and program revenues are shared. The Provost's working group should recommend ways to improve existing program structures as well as recommend templates for truly shared undergraduate degree programs. Included in the considerations of the working group should be how roles and responsibilities, costs and revenues might be split between the participating units even if the attributions of costs and revenues are not consistent with current practices or with the current University budget model.

(C) Recommend programs that the Provost could put in place to provide financial incentives for schools and colleges to support team teaching across units.

At present there are various arrangements, put in place on an ad hoc basis, whereby the Provost supports some part of a faculty member who is teaching across units. In most cases, these programs support some fraction of the cost of the faculty member to make the appointment more affordable to the hiring unit. The working group should recommend appropriate ways to put these programs in place more broadly.

We also believe that the level of compensation provided for a faculty member's effort in a course should scale with their level of involvement. Thus a faculty member who is involved in the course for 7 of the 14 weeks in the semester should be compensated at half of this recommended 16.67% level and so on. Of course, faculty should continue to provide individual guest lectures in a course without compensation when they can offer particular expertise that brings distinctive value to the course.

C. Conclusion: The Scope of the Challenge

Nearly everyone believes that the university should do more team teaching and should support more interdisciplinary learning. Why is it so difficult to develop and sustain such endeavors? The simplest explanation for the slow expansion of team teaching and interdisciplinary learning is their high cost compared to the traditional single-instruction/single-discipline model. Are they *inherently* more costly than the traditional model, or are the higher costs artifacts of the production system as currently designed? We believe it is the current production system that makes the alternative more costly than the traditional model. The traditional model has the advantage of being well established and highly refined.

In contrast, team teaching and interdisciplinary learning are relatively new in the context of modern higher education, and the learning costs are still high. In addition, the transaction costs associated with coordinating team teaching and interdisciplinary learning are high. It takes a lot more effort to coordinate a course with multiple instructors who come from disparate backgrounds than it does to coordinate a course taught by a single instructor with set ways of doing things. Nevertheless, the university does know how to manage the delivery of multiple intellectual perspectives through breadth requirements, cognate courses and other mechanisms, coordinated by curricula within and between schools and colleges. The course-level coordination problems of team teaching and interdisciplinary learning are simply of a different granularity. With experience, the coordination costs for team teaching and interdisciplinary learning would probably go down significantly. The difficulty will be in the transition from a world in which team teaching and interdisciplinary learning are rare, to one in which they are commonplace.

This transition will be costly. Much of the knowledge needed to make this transition must be gained through the process of learning-by-doing, which is always much more expensive than staying with what is already known. Are the benefits of team teaching

and interdisciplinary learning truly worth the cost the university must bear to make the transition, especially at a time of severe fiscal stress? We recognize that this is a controversial question, but we believe the benefits outweigh the costs. Our conclusion are grounded in the claims that the society at large needs graduates with skills that can come only from innovations such as team teaching and interdisciplinary learning, and that the challenge is manageable because the university has already demonstrated its capability to make such shifts.

We already acknowledge that learning must be a lifelong endeavor, and in many fields continuing education is mandatory. What kind of undergraduate education best prepares an individual for a life of productive endeavor relevant in the 21st century? It is an education that puts great emphasis on how to learn in an autodidactic manner and in work-related teams, as well as in the traditional classroom setting. Team teaching and interdisciplinary learning are essential components of such an education.

We believe that there has been a great deal of successful innovation at the University of Michigan to guide our thinking for the future. Much of this has been at the undergraduate level. In addition, there has been significant experimentation in the professional schools, brought about at least in part by these schools' close working relationships with employers. Many of Michigan's professional schools incorporate team teaching and interdisciplinary learning, and some have been experimenting with strategies that move learning outside the classroom altogether. The University of Michigan's undergraduate and graduate professional programs provide an excellent test bed for innovation, and probably have much to learn from each other. The university is capable of major innovations in support of team teaching and interdisciplinary learning, and this enables the university to act strategically in this challenge.

The foregoing arguments speak to the need to move aggressively toward a new vision of education in which team teaching and interdisciplinary learning are the norm rather than the exception. We now reemphasize the significant transition costs the university will face in creating such an environment. Some of the changes needed will strike at the heart of the university as we currently know it.

We close by noting that the University of Michigan has a long and constructive experience with task forces to address difficult challenges. Some task force reports are acted on immediately and in full. Others are quietly filed away in organizational memory, to be pondered later. Many of the recommendations made in this report can be acted on quickly, and we hope they are considered carefully. The broader implications of this report will take a while to sink in. We do not expect the collegium of the University of Michigan to rally immediately around a dramatic and costly transition from a tried-and-true tradition to a new and unexplored alternative. We do humbly suggest, however, that the collegium will come to see that such a transition is necessary, and will embrace it in due course. This report is a reminder to those engaged in that transition months or years hence that the transition has been under consideration for a while.

APPENDICES

Appendix I: Charge to the Presidential Task Force on Multidisciplinary Education and Team Teaching

One of the University of Michigan's defining characteristics is its multidisciplinary scholarship and research. As scholars, we appreciate the power that is brought to bear on a problem by combining ideas, methods and approaches from a variety of disciplines. We understand that interdisciplinarity emerges naturally from problem-solving - substantive issues are often multifaceted and not constrained to lie within the boundaries of a single discipline.

As educators, we have the obligation to prepare students who can bring this power to bear on the problems they will face at the university and beyond, who look naturally to problem-solving approaches at the intersection of existing bodies of knowledge. Our students should learn to embrace new and emergent ideas and should develop the skills to collaborate with others who bring perspectives to a problem that are different from their own.

Experience is crucial to student learning and so we must embed multidisciplinary and multidisciplinary activities as a more regular part of the intellectual training we provide, particularly at the undergraduate level. In the classroom setting, this will require the creation of greater opportunities to pair faculty from divergent disciplines to design and teach new classes or to enrich existing classes.

The president and the provost are committed to taking steps to extend Michigan's multidisciplinary culture more effectively into undergraduate education. At the early stages of this effort, rather than have the entire Task Force focus on the whole of these issues, we will divide and conquer by separating into subgroups that will focus on particular topical areas. Each subgroup will then convene on its own between meetings of the Task Force, and report its conclusions and recommendations to the group. The three subgroups will address issues concerning:

1. **Programmatic Opportunities**
   This group will:
   - Recommend potential topic areas for new multidisciplinary courses, seminars, and programs, as well as pathways for implementation of such initiatives at the department or college level. Topic areas for consideration and assessment could include: International and comparative studies, globalism, environmental studies, etc. The group should explore other promising topics.
   - Consider whether there is room in the curriculum for innovation and the creation of non-standard courses within these topic areas.
   - Consider related issues including: Course/program structure, particulars of creating majors or minors, & practices for overcoming inter-departmental curricular discrepancies.

- Recommend measures to foster team-teaching, multidisciplinary education, and teaching across college boundaries particularly within the identified topic areas.

2. Faculty Engagement

This group will:

- Make recommendations about incentives and models that units can utilize to engage faculty in multidisciplinary and team teaching as a means for them to educate undergraduates. Particular attention should be given to professional programs, the sciences, and other areas where multidisciplinary teaching has potential for growth.
- Make recommendations regarding ways to facilitate and recognize teaching and course offerings by faculty in colleges other than their own, such as the Presidential Scholars program.
- Focus on pedagogical and classroom issues related to multidisciplinary and team teaching, such as teaching models, syllabi, appropriate course materials, classroom activities, assignments, grading, etc.

3. Administration & Budget

This group will:

- Recommend methods for removing institutional obstacles to the adoption by faculty of cross-disciplinary teaching practices.
- Advise and assist the provost in developing an equitable and sustainable budget model to support multi-disciplinary team-teaching. (This will be an essential element of making it easy to institute team-teaching).
- Recommend mechanisms that allow faculty and administrators to easily incorporate team teaching when it appropriately enhances existing courses as well as new courses. These mechanisms should be sufficiently simple and straightforward so that faculty and administrators will not view the mechanism itself as a barrier.
- Consider whether administrative processes can be streamlined to support the development and approval of cross-unit courses.
    i. How can barriers to the approval of non-standard course be removed?
    ii. Can we make innovative courses available as options?

Appendix II:

MEMBERS & WORK OF THE TASK FORCE

The members of our task force were chosen from a variety of disciplines and areas of the University. Several members of our task force are from graduate and professional schools reflecting the priority articulated in our charge to promote involvement of graduate and professional faculty in undergraduate instruction. Also included on our task force are deans from two schools, the Ford School of Public Policy and the School of Information, that are anxious to become more involved in undergraduate instruction. Both schools are in the stage of planning undergraduate programs. The task force was staffed by the President's Office and engaged the efforts of a GSRA, Tom Perorazio, who is a doctoral candidate in the Higher Education Program in UM's School of Education.

The Task Force was composed of the following members:

Rebecca Blank	Gerald R. Ford School of Public Policy
Sherman Clark	Law School
Constance Cook	School of Education and CRLT
Jared Feeney	Undergraduate student in LS&A
Phil Hanlon (Chair)	LS&A and Provost's Office
June Howard	LS&A and Rackham
Wayne Jones	College of Engineering
John King	School of Information
Andrew Kirshner	School of Art and Design
Martin Philbert	School of Public Health
Thomas Perorazio	Doctoral Candidate, School of Education
William Smith	Medical School
Mark Tessler	LS&A and the International Institute

Our Task Force benefited greatly from the expertise that has been developed within CRLT on the topic of team teaching. Crisca Bierwert from CRLT helped us tap that expertise serving as an informal consultant to our group over the past year.

By way of process, our task force held a series of meetings during the fall semester which were aimed at better understanding the problem that we are trying to address. We met with the Provost and with numerous faculty and staff who had been involved in team teaching efforts or in supporting team teaching in an administrative capacity. A complete list of those who we met with, either as a group or as individual task force members, is included in Appendix III. With the collaboration of CRLT and the Provost, we organized the fall 2004 Provost's Seminar on Teaching around the theme of team teaching. At that Seminar, faculty members took part in an exercise in which they were asked to come up with an idea for a team-taught course in collaboration with a small group of faculty who they were teamed with on that day. In many cases, the disciplinary training amongst these faculty groups was highly diverse. Nevertheless, several of the course concepts were highly coherent and worthy of further development. Also at the Provost's Seminar, President Coleman, Provost Courant and

Associate Provost Hanlon held a panel discussion which included input from the faculty participating in the Provost's Seminar.

During the winter of 2005, our task force split into subgroups to study two subtopics – the advancement of team taught courses and the creation of multidisciplinary programs. The two subgroups came back together in a series of meetings of the whole task force which culminated in a day-long retreat in early May. Coming out of that retreat was a tentative set of findings and recommendations. During the months of May through August, task force members briefed various groups on campus, including Deans and executive committees of schools and colleges, the Executive Officers, the Associate and Vice Provosts, and the Undergraduate Council. These briefings provided valuable feedback that have shaped the final set of findings and recommendations that appear in subsequent sections of this report.

Before proceeding to the issues studied by the task force, we should say a word about the scope of our work. First and foremost, the task force is not a curriculum committee, so we felt it beyond our mandate to recommend specific areas of study or speak to the programmatic needs in departments. Second, we did not address pedagogy or specific strategies for teaching & learning in any sort of comprehensive way. We felt other bodies would be more qualified to take up such issues. Finally, we did not provide a full treatment of the concept of interdisciplinarity; the perspective we take is described in the following sections, and flows from our charge to make recommendations regarding team teaching.

Appendix III: Barriers to Team Teaching as Compiled by CRLT

In our examination of the potential for increased team teaching on campus, we have had many discussions about the ambitions of faculty that have bumped up against the reality of barriers that have prevented or made the launch of a collaborative teaching initiative more difficult. Finding solutions to these issues has been a priority for the Task Force. The barriers we have considered are similar to those uncovered by CRLT in a 1998 Provost's Seminar on Teaching. The barriers are presented in five groups:

Funding and Sustainability

- Need sufficient resources for course start-up and continuing resources to sustain the course.
- Need support for GSIs and technological support.
- Need to buy out faculty from other departmental teaching and find ways to cover regular departmental courses.
- Most academic units have few, if any, resources committed to interdisciplinary teaching.
- Use of multiple faculty in one team-taught course is expensive.

Faculty Time and Energy

- Interdisciplinary teaching needs much time and energy for intellectual and logistical planning; requires more time than conventional disciplinary thinking.
- Can lead to faculty burn out; is this kind of teaching possible over the long term?
- A single person can become interdisciplinary if given preparation time.
- Need sites where faculty can talk about interdisciplinary team teaching (like today's event); a lot of excitement was generated today, but how can faculty sustain it?
- Time and resources are less available for junior faculty.

Tenure/Reward Issues

- Inflexible institutional reward system makes it difficult for faculty, especially junior faculty, to do interdisciplinary team teaching.
- Hard to evaluate interdisciplinary faculty work; does it count toward career advancement?
- There are differences across deans and departments about the effect of interdisciplinary teaching on salary review.
- The usual departmental attitude is that faculty should teach within the disciplines; there is tension between the need to cover departmental teaching needs and the wish to innovate in interdisciplinary ways.
- Faculty are rewarded more for interdisciplinary research than interdisciplinary teaching; there is a lack of professional recognition for what is primarily a teaching activity.
- Interdisciplinary team teaching involves risk-taking (both emotional and intellectual) by both individuals and departments.

Bureaucratic Issues

- Where is ownership of the course? Which is the home unit? Difficult approval processes.
- Faculty need help with course administration, especially infrastructure support for scheduling course time, choosing location, doing cross-listing, overcoming timetable difficulties, figuring out number of credits.
- It's hard for faculty to share information about bureaucratic issues, so we all have to figure out for ourselves how to make interdisciplinary teaching work.
- How do we match cultures in various colleges?
- Geography of the campus makes logistics tough.

Student Issues

- GSIs need to have a wide range of knowledge, both breadth and depth; how do we cultivate that?
- There may be great disparity in backgrounds of students taking interdisciplinary courses; what are the course goals?
- How does one fit these courses into degree programs and meet undergrads' major requirements and grad students' tightly structured programs?
- Hard to market interdisciplinary courses to students; need to find effective mechanisms.

Appendix IV: Data on Existing Courses and Programs

Class Sections Taught By More Than One Faculty Member
By School/College, Department Offering Course, Subject, and Course Level
Fiscal Year 2003-04

School/ College	Department	Subject	Faculty Appointed in Course Department	Course Level				Total Organized Sections Offered
				Lower	Upper	Graduate	Total	
Art and Design				**0**	**2**	**15**	**17**	**328**
	School of Art And Design	Art and Design	All		2	15	17	
Architecture & Urban Planning				**0**	**8**	**6**	**14**	**280**
	College of Arch & Urban Planning	Architecture	All		7	2	9	
		Architecture	At Least One			1	1	
		Urban Design	All		1		1	
		Urban Planning	None			3	3	
Business Administration				**0**	**0**	**10**	**10**	**801**
	School of Business Admin	Business Administration	All			3	3	
		Business Administration	At Least One			1	1	
		Business Administration	None			1	1	
		Corp Strategy & Internat Bus	All			2	2	
		Executive MBA	All			1	1	
		Operations & Management Sci	At Least One			2	2	
Education				**0**	**0**	**2**	**2**	**306**
	School of Education	Education	All			2	2	

Engineering				**23**	**29**	**9**	**61**	**1,504**
	Aerospace Engineering	Aerospace Engineering	All		2		2	
		Aerospace Engineering	At Least One		2		2	
	Atm, Oceanic And Space Science	Atmos, Oceanic & Space Sci	All	2	2	2	6	
	Biomedical Engineering	Biomedical Engineering	All		1		1	
	Chemical Engineering Department	Chemical Engineering	All	1	2	1	4	
		Chemical Engineering	At Least One		7		7	
	Engineering Undergraduate Educ	Engineering	All	11			11	
		Engineering	At Least One	4			4	
		Engineering	None	2	2		4	
	Industrial-Operations Engr Dept	Industrial & Operations Engin	All			1	1	
		Industrial & Operations Engin	At Least One			1	1	
	Interdisciplinary Prof Program	Automotive Engineering Program	At Least One			2	2	
	Mech Eng & Applied Mech Dept	Mechanical Engineering	All	1	4		5	
		Mechanical Engineering	At Least One	2	5		7	
	Naval Arch & Marine Engr Dept	Naval Arch & Marine Engin	All			1	1	
	Nuclear Engr & Radiological Sc	Nuclear Engin & Radiolog Sci	All		2	1	3	
Information				**0**	**0**	**6**	**6**	**110**
	School of Information	Information	All			6	6	
Kinesiology				**0**	**0**	**0**	**0**	**218**
Law				**0**	**0**	**9**	**9**	**280**
	Law School	Law	All			6	6	
		Law	At Least One			3	3	
Literature, Science and the Arts				**63**	**67**	**67**	**197**	**8,795**
	American Culture Program	American Culture	All		3		3	
		American Culture	At Least One		1	1	2	
	Anthropology Department	Anthropological Archaeology	All			1	1	
		Anthropology,Biological	All			1	1	
		Anthropology,Cultural	All		1	3	4	
		Anthropology,Cultural	At Least One		1	3	4	
		Anthropology,Cultural	None			1	1	
	Asian Languages And Cultures	Asian Languages	All	17	7		24	

LSA, *con't*		Asian Studies	At Least One			1	1
	Astronomy Department	Astronomy	All	1	3	1	5
	Biology Department	Biology	None	5	2		7
		Molec, Cell & Develop Biology	None		1		1
	Center For Chinese Studies	Chinese Studies	None			1	1
	Chemistry Department	Chemistry	All	6	1	2	9
		Chemistry	At Least One		1		1
		Chemistry	None		1		1
	Classical Studies Department	Great Books	At Least One	2			2
	Comparative Literature Program	Comparative Literature	At Least One		1		1
	Ctr Afro-Amer & African Studie	Afroamerican & African Studies	All	2			2
	Department of Linguistics	Linguistics	All	3			3
		Linguistics	None		1		1
	Ecology & Evolutionary Biology	Ecology & Evolutionary Biology	All		1	2	3
		Ecology & Evolutionary Biology	At Least One		1		1
		Ecology & Evolutionary Biology	None		1		1
	Economics Department	Economics	All			12	12
		Economics	At Least One			2	2
	English Language & Lit Dept	English Lang & Literature	All	1			1
		English Lang & Literature	At Least One		1		1
	English Language Institute	English Language Institute	All		4	2	6
	Geological Sciences	Geological Sciences	All	4	5	2	11
		Geological Sciences	At Least One		1		1
	Germanic Languages & Lit Dept	German	All		2		2
	History Department	History	All		1	5	6
		History	At Least One	1	1	1	3
		History	None		1		1
	History of Art Department	History of Art	All			1	1
		History of Art	At Least One			1	1
	Honors Program	College Honors	None		3		3
	Latin Amer & Carribean Studies	Latin Amer & Caribbean Stu	None			1	1
	LS&A First Year Seminars	University Courses	All	1			1
		University Courses	None	9			9
	Molecular,Cell & Devel Biology	Molec, Cell & Develop Biology	All		2	1	3

LSA, *con't*	Near Eastern Studies Department	Ancient Civiliz & Biblical Stu	All	1			1	
		Ancient Civiliz & Biblical Stu	At Least One	1			1	
		Arab, Armen, Pers, Turk& Islam	At Least One		1		1	
	Philosophy Department	Philosophy	All			1	1	
		Philosophy	At Least One			2	2	
	Political Science Department	Political Science	All	1		4	5	
	Program in Film and Video	Film and Video Studies	All		2		2	
		Film and Video Studies	At Least One		1		1	
	Program in the Environment	Environment	All		4		4	
		Environment	At Least One	2			2	
		Environment	None		4		4	
	Psychology Department	Psychology	All		4	5	9	
		Psychology	At Least One		1	6	7	
	Romance Languages Department	French	All	1			1	
		French	At Least One		1		1	
		Spanish	All	4			4	
	Slavic Languages & Lit Dept	Slavic	All	1			1	
	Sociology Department	Sociology	All			1	1	
		Sociology	At Least One			1	1	
		Sociology	None			1	1	
	SRC-PSM Graduate Program	Survey Methodology	None			1	1	
	Women's Studies Program	Womens Studies	All		1		1	
Residential College				**6**	**2**	**0**	**8**	**209**
	Residential College	Humanities	All	1	1		2	
		Humanities	At Least One	3			3	
		Interdivisional	At Least One		1		1	
		Social Sciences	All	1			1	
		Social Sciences	None	1			1	
Music				**4**	**5**	**4**	**13**	**852**
	Department of Dance	Dance	All	1	3		4	
		Dance	At Least One	3	1	1	5	
	School of Music	Conducting	All			1	1	
		Ensemble	All		1		1	
		Musicology	All			1	1	
		Voice Literature	All			1	1	

Natural Resources & Environment				**0**	**0**	**4**	**4**	**83**
	Sch of Nat Resources & Environ	Nat Resources & Environment	All			3	3	
		Nat Resources & Environment	None			1	1	
Nursing				**13**	**18**	**35**	**66**	**414**
	School of Nursing	Nursing	All	13	18	32	63	
		Nursing	At Least One			3	3	
Pharmacy				**0**	**7**	**14**	**21**	**67**
	College of Pharmacy	Medicinal Chemistry	All		2	2	4	
		Medicinal Chemistry	At Least One		1	1	2	
		Pharmaceutical Sciences	All		3	1	4	
		Pharmacy	All		1	8	9	
		Social & Administrative Sci	All			2	2	
Public Health				**0**	**0**	**7**	**7**	**283**
	Environmental-Indust Health De	Environmental Health Sciences	All			2	2	
	Epidemiology Department	Epidemiology	All			4	4	
		Epidemiology	At Least One			1	1	
Public Policy				**0**	**0**	**1**	**1**	**59**
	School of Public Policy	Public Policy	All			1	1	
Rackham				**0**	**0**	**1**	**1**	**10**
	Graduate School	Rackham Graduate School	None			1	1	
Social Work				**0**	**0**	**5**	**5**	**201**
	School of Social Work	Doctoral	All			4	4	
		Social Work	All			1	1	
Total All Schools/Colleges				**109**	**138**	**195**	**442**	**14,800**
			All	74	93	150	317	
			At Least One	18	29	34	81	
			None	17	16	11	44	

Source: CR01 CRAS data set
Notes:
Data is not available for the School of Dentistry, the Medical School, or the Officer Education Program because they are excluded from the CRAS data set.

All sections in this report are taught by two or more faculty members with contact percent of at least 10% and in one of the following ranks: professor, professor emeritus, associate professor, assistant professor, instructor, lecturer, and all ranks of adjunct faculty. For purposes of grouping the faculty by appointing department, the appointing department of any other instructional and non-instructional staff with responsibility for teaching a section was not considered.

Sections were grouped into one of three categories based on how many of the faculty members were appointed in the department offering the course: All, At Least One (one or more, but not all), or None.

Lower level sections include courses with a catalog number between 100 and 299, upper level sections include courses with a catalog number between 300 and 499; and graduate level sections include courses with a catalog number 500 or greater. Only organized classes were included in this summary.

Total Organized Sections Offered include all of the class section types except PSI and IND.

Class Sections Taught By More Than One Faculty Member
By School/College, Class Size, and Course Level
Fiscal Year 2003-04

School/College	Class Size	Course Level			Total
		Lower	Upper	Graduate	
Art and Design		**0**	**2**	**15**	**17**
	1 to 10		2	15	17
Architecture & Urban Planning		**0**	**8**	**6**	**14**
	1 to 10		1	1	2
	11 to 40		4	2	6
	41+		3	3	6
Business Administration		**0**	**0**	**10**	**10**
	1 to 10			2	2
	11 to 40			3	3
	41+			5	5
Education		**0**	**0**	**2**	**2**
	1 to 10			1	1
	11 to 40			1	1
Engineering		**23**	**29**	**9**	**61**
	1 to 10		1	3	4
	11 to 40	6	13	6	25
	41+	17	15		32
Information		**0**	**0**	**6**	**6**
	41+			6	6
Law		**0**	**0**	**9**	**9**
	1 to 10			2	2
	11 to 40			7	7
Literature, Science and the Arts		**63**	**67**	**67**	**197**
	1 to 10	7	22	42	71
	11 to 40	32	32	25	89
	41+	24	13		37
Residential College		**6**	**2**	**0**	**8**
	11 to 40	6	2		8
Music		**4**	**5**	**4**	**13**
	1 to 10		2	4	6
	11 to 40	4	3		7

Natural Resources & Environment		**0**	**0**	**4**	**4**
	1 to 10			2	2
	11 to 40			1	1
	41+			1	1
Nursing		**13**	**18**	**35**	**66**
	1 to 10		4	17	21
	11 to 40	5	7	18	30
	41+	8	7		15
Pharmacy		**0**	**7**	**14**	**21**
	1 to 10			5	5
	11 to 40			4	4
	41+		7	5	12
Public Health		**0**	**0**	**7**	**7**
	1 to 10			3	3
	11 to 40			2	2
	41+			2	2
Public Policy		**0**	**0**	**1**	**1**
	11 to 40			1	1
Rackham		**0**	**0**	**1**	**1**
	11 to 40			1	1
Social Work		**0**	**0**	**5**	**5**
	1 to 10			3	3
	11 to 40			2	2
Total All Schools/Colleges		**109**	**138**	**195**	**442**
	1 to 10	7	32	100	139
	11 to 40	53	61	73	187
	41+	49	45	22	116

Source: CR01 CRAS data set
Notes:
Data is not available for the School of Dentistry, the Medical School, or the Officer Education Program because they are excluded from the CRAS data set.

All sections in this report are taught by two or more faculty members with contact percent of at least 10% and in one of the following ranks: professor, professor emeritus, associate professor, assistant professor, instructor, lecturer, and all ranks of adjunct faculty.

Lower level sections include courses with a catalog number between 100 and 299, upper level sections include courses with a catalog number between 300 and 499; and graduate level sections include courses with a catalog number 500 or greater. Only organized classes were included in this summary.

All of the class section types except PSI and IND are included.

Appendix V: Models and Programs in Place at Michigan

This section presents models of team-teaching and interdisciplinary programs currently in place at UM. Appendix VII contains a listing of generic models for course structure and classroom time found in the literature.

1) **Collaborative Courses**

These are courses where faculty with related expertise co-plan and co-teach large courses or small ones. Some of these courses, like Introduction to Gay and Lesbian Studies, started with the assistance of CRLT's IFA funding. Others, like 300- and 400-level special topics courses, are co-taught by two faculty who may change the course focus each time they teach together. Still others are part of a core curriculum where collaboration is central, and the roles of instructor and observer are intrinsic to teaching practice (as in some Dance courses).

Example: Origins of Nazism

Origins of Nazism is a large lecture course that is a regular offering cross-listed in History and German, with one professor representing History and the other Germanic language and literature. T--he conceptualization of the course is based on the interdisciplinary idea that political and social history is more comprehensively taught and learned alongside studies of culture and ideology, and vice-versa. The course is taught by the same two faculty members on a regular basis; at times, another faculty member has stepped in for one of these two. The course was conceived, initiated, and sustained by the faculty interested (rather than being prompted by administrative goals). It attracts more than 300 students each Winter. The faculty bring complementary expertise to the course design, supply and refresh course content and materials on a regular basis, co-plan the syllabus, divide the lecturing, and work together to coordinate the GSIs.

2) Integrated Lecture Courses

These are large classes in which the curriculum is planned and coordinated by a single faculty leader who is responsible for the course. Typically, the course is organized around a complex, multifaceted topic that requires coverage from many disciplines. Multiple faculty members from different units deliver portions of the course.

Example: Global Change

Global Change is an interdisciplinary program of team-taught courses for first- and second-year undergraduates focusing on global change from physical and human perspectives, utilizing science and social science education. The course was started by faculty with common interests in the problem that realized many disciplines were needed to understand the issues. It is now part of the Program in the Environment and is cross-listed in six departments.

Currently, three courses are offered, each taught by teams of four faculty. Courses are topic focused, and connections across the disciplines made transparent, so that it's not obvious to students that viewpoints are from one particular discipline or another.

Each is led by a course director, who gets course teaching credit. Other faculty get credit for the amount they contribute, rather than where they teach. The team leader is at all classes, and this person coordinates modules, exam writing, GSI consulting, etc. Assessments and evaluations of curses occur during and after the program.

3) Meet-together

Rather than designing an entirely new course, two or more separate classes on related topics can scheduled to meet at the same time, with the courses occasionally holding joint sessions. These are typically discussion sessions to share perspectives from the two groups of students. In some cases, it is possible to have group research projects with mixed teams.

As an example of a meet-together we use a course that is proposed but not yet in place. John Laird proposes an introductory course in Computer Games that would be taught in multiple sections, each section emphasizing a different aspect of the subject. So one section might emphasize the visualization and artificial intelligence aspects of computer games, another section might emphasize the narrative and artistic presentation of computer games, another might emphasize the impacts of computer games on the attitudes and behaviors of the people who play them. These sections would meet separately most days of the week but then would come together for joint lectures or computer lab activities one or two days per week.

4) Intergenerational Apprentice Models

In these models, single courses have instructional activities shared amongst faculty, graduate students and/or post-doctoral students, and advanced undergraduates. Activities can range from seminar discussions to group work, and from background research to published articles.

Example: IGR dialogues courses

The program on Inter-Group Relations is a joint effort of the Division of Student Affairs & LSA. Its courses are based in Psychology, but also cross listed in Sociology. In IGR, teams of faculty, graduate students, and advanced undergraduates students teach courses modeling facilitation of dialogue on complex and controversial issues. The Program on IGR assigns faculty to teach courses and provides them with staff support. Undergraduate student facilitators are given one semester of training

Example: Chemistry Department

Through the Chemical Sciences at the Interface of Education (CSIE) program, the department has found a way to instruct its students in teaching and learning processes, in addition to their preparation for work in chemistry. For example, in Honors Organic Chemistry, since 1994, a team of eight junior & senior undergraduates have designed a supplemental instruction program for 160 of the 1200 students enrolled in Chem 210 & 215. The student teams have literature-based assignments that are subject to critique and peer review. The second semester results in a print and web-based text of teaching materials written by 80-100 for one another, developed from reviews of recent literature.

Also, newly developed sections of General Chemistry incorporate lab, lecture, and discussion into one class session. One faculty serves as the group director, and a postdoctoral student, graduate students in the Preparing Future Faculty program, and undergraduates have formed teams. The course is taught by either the faculty, or the post-doc (under the guidance of the faculty), the graduate students serve as studio-instructors, while undergraduate students prepare teaching materials, as in the Honors courses.

5) Learning Communities

Learning communities at Michigan are small groups—often self-selected—of students and faculty members that work together around a set of common intellectual interests and have multiple opportunities to interact inside and outside the classroom. Residential programs are located in a University Residence Hall and require students to live in the specific hall where the program is housed. Residentially-based learning communities all have in-house academic advisors, a library, a computing site, and a staff of live-in residential staff. Non-residential programs have no residential requirement and are located at different sites on campus. These programs offer a range of support services that vary from peer advisors to mentors to faculty instructors.

Residential Program Example: Health Sciences Scholars Program (HSSP)

The HSSP is dedicated to providing support to first-year undergraduate students interested in exploring the wealth of opportunities in the health sciences and professions. HSSP students take a one-year core course that explores opportunities in a wide range of health fields, observe faculty and clinicians in real-life health settings, meet faculty, advisors, and students from UM's health schools at co-curricular events, and participate in community service, multicultural, and wellness events.

Appendix VI: Collaborative Teaching Models and Templates

Collaborative teaching includes variation in faculty interactions and the structure of the course. Each of these is very briefly outlined below:

1) Structure of Pedagogical Interactions Between Collaborating Faculty

Team Teaching
- Both teachers share the planning and instruction of students in a coordinated fashion.

Lead and Support
- One faculty member leads in presentations and another specializes in organizing and facilitating small groups.
- Course must be planned by both, and course adjustments are decided upon by both.

Rotational Teaching
- Faculty members plan the course design together, then individually develop student projects and/or clusters of assignments that will complement one another.
- The students are divided into heterogeneous groups and work on different projects at the same time.
- As the term proceeds, the students rotation among the different projects.
- Faculty rotate working with different groups in their area of specialization, and in working with groups to help them integrate the projects into the overall course

Alternate Teaching
- Faculty jointly plan instruction, but only one presents material, with the other responding at any time.
- The faculty change roles throughout the course (even within each unit).
- This is not a "tag-team" approach, where the faculty simply alternate presenting materials without co-planning or responding to one another.

2) Structure of the Course and Class Time

James (1995) advises that the issue is not whether two or more faculty participate in the administration of a course, but the type and degree of collaboration exhibited by the faculty members. Below are some widely-applicable examples of how courses can be organized and class time used.

a. Co-teaching

Course planned and taught by two or three faculty members
- Topics, materials and assignments are integrated and/or interrelated
- Two faculty in the classroom at all times, commenting on one another and on course material
- Co-facilitation of discussion and/or alternative facilitation of student groups.

Variants for lecture class:

1. GSI(s) teach section discussions
2. Faculty teach section discussions

Variation for co-curricular class

- Work outside the classroom work is integral (community work, service, exhibit-building, etc.).

Immersion variation:

- Students and faculty work together for a sustained, intensive time.
- Scheduled for spring or summer term, breaks, or weekends.
- Often experiential or co-curricular.
- Often mini-courses (for intensive one-credit, for example).

b. Integrated Lecture Series

Course planned and coordinated by one or two core faculty members, with guest lecturers providing some core materials and lectures for the course.

– Topics are typically multifaceted, necessitating interdisciplinary perspectives by faculty from diverse backgrounds

Variations:

1. Core faculty AND lecturing faculty plan course together
2. Core faculty plan course and advise guest faculty on lecturers

– *Examples*

- Module courses, survey/introductory courses

c. Linked Courses

Seminar course created by two faculty members provides a framework for students to bring together themes, topics, and analytical tools, from two courses taught separately by these two faculty members.

- Faculty teach the seminar together as the second course for each.
- Usually used to link large lecture courses.
- Some students register for both courses and seminar, while other students register for only one course.

- *Examples*

- Two courses on a related topic, although from different disciplines, linked to an integrative seminar course

d. Complementary courses

Two separate courses planned by two faculty members to be integrated or complementary with one another, for students to take in the same term.

- The courses are listed in two departments or programs, with separate numbers, and meet at different times.

- Faculty involvement
  - Co-construct syllabi around a shared theme
  - Coordinate syllabi and assignments

- *Examples*
  - Writing course/General Ed course
  - Supplemental instruction course tied to challenging courses (math, physics, etc.)

e. Learning Clusters

- Extension of linked courses, connecting 3-4 courses
- Can be a full schedule for enrolled students
- Usually focused on general education

- *Example*
  - Writing/communications course, paired with 1-2 disciplinary courses, and an integrative seminar

f. Meet-together courses:

Two separate courses planned by two faculty members to be complementary with one another in some respects.

- The courses scheduled at the same time.
- The courses meet together sometimes, for faculty to share lecturing and leading discussion for both groups, and for the students to share views on related material.

- *Example*
  - Two disciplinary courses on a related topic, each coupled with an occasional discussion session meeting the same term, led by the two faculty members.

g. Tag-team teaching

- Course planned by faculty who "divide the labor" and schedule themselves to alternate in presenting material to students.
- Single course taught over one term, but the two faculty members are not present together.

- *Example*
  - Research methods, with different methods and approaches to inquiry taught separately

h. Federated Learning Communities

1) <u>Federation of 3 disciplinary courses</u>
   - Faculty plan and coordinate the course together

2) <u>Program seminar</u>
   - For faculty, allowing for discussion or scholarship/research among colleagues for purposes of the course

- For students, serves as a discussion section

3) Support for a "Master Learner"
   - Faculty members released from teaching for a set period
   - Study in areas in which they do not have expertise
   - MLs lead discussion section, assisting students in mastery of this new material
   - MLs assist teaching faculty with feedback about methods, student difficulties

4) Creation of a new "core course"
   - Meets monthly, over 1 year/3 terms
   - Is team-taught by the faculty in the 3 FLC courses
   - Has the pedagogical goal of moving students from passive recipients to active learners and participants in interdisciplinary inquiry

Appendix VII: Potential Administrative Structures

This section presents four models of administrative structures that are successful at other universities and may be appropriate to support and encourage collaborative teaching efforts at the U-M at a later time.

1) Innovation Center

Designed to be a single unit, incorporating academic, financial, and logistical support for cross-unit collaborations.

A new administrative home to interdisciplinary and team taught courses—such as the Dewey Center, as proposed by the President's Commission on the Undergraduate Experience—remained an intriguing possibility to the members of this Task Force. Such a unit would be a separate administrative unit; independent of the academic schools and colleges. Several models also combine academic programs like freshmen interest groups or undergraduate research programs with administrative units like academic advising or faculty development. The unit could serve as a laboratory for experimental courses and function as an incubator for new pedagogical initiatives that cannot be administered from any single program. It could also award funding to faculty for successful team-teaching proposals, or scholarships for students who engage in intergenerational teaching with faculty. In addition, the center could provide logistical and staff support for the development and sustenance of new team-taught courses, as well as offering a network connecting faculty and students across academic units.

Examples

The James M. Johnston Center for Undergraduate Excellence, UNC-Chapel Hill

As part of its efforts to revitalize undergraduate education, preference is given to projects that join the interests of several units, serve broad cross-sections of the campus, reach across disciplinary boundaries, and provide for innovative teaching and learning experiences. The center offers financial awards for course development—paid as summer salary—for innovative, interdisciplinary courses. It also manages a living-learning program for students desiring self-directed inquiry.

Office of Undergraduate Education, University of Washington

The OUE offers opportunities and resources for students, faculty members and academic departments and programs, including undergraduate advising, educational assessment, first-year programs, and honors classes. It also provides administrative support and oversight for the University's Honors Program, Program on the Environment, Center for Quantitative Science and the Teaching Academy. The program has a single location—Mary Gates Hall—where all academic and administrative support are housed.

2) Academic Unit Oversight

A large and diverse academic unit, such as Arts & Sciences, combines interdisciplinary studies with its existing course offerings, and coordinates the development and support of team-taught courses and programs.

In this model, programs and course build on existing disciplines and fosters collaboration of units. Administration is done by existing unit staff. For programs beyond Arts & Sciences, the unit coordination its efforts with other schools and colleges.

Example
Undergraduate and Interdisciplinary Studies (UGIS), College of Letters and Science, UC-Berkeley

Within the Berkeley Liberal Arts College, UGIS serves as a locus for innovations that extend beyond traditional disciplinary boundaries. UGIS offers courses, minors, and majors that connect the disciplines within its five colleges and has agreements with professional schools and colleges which administer non-divisional programs.

3) Interdisciplinary Institute

An intellectual association that gathers together faculty, students, visiting scholars, and other members of the campus community for interdisciplinary discussion, programs, and research projects. Not an academic unit; more akin to a consortia.

The institute can be a clearinghouse for faculty enrichment, course development, and the creation of programs and events. Intellectual innovation is generated here, but logistics for courses are handled by supporting units. The institute supports events such as faculty colloquia, conferences, public presentations, speakers, and panel discussions.

Examples
University Studies, University of Tennessee-Knoxville
Billed as UT's "transdisciplinary faculty development program", University Studies facilitates exploration of disciplinary boundaries by offering a wide-range of interdisciplinary activities. US consists of members of the University community, current and emeritus faculty, and collaborating colleagues who have joined with one another to explore and possibly transcend disciplinary boundaries. By keeping institutionalized program functions to a minimum, University Studies is able to support the interdisciplinary activities that faculty are eager to undertake but which require institutional support. Because University Studies relies on intrinsic motivation, its use of resources is very efficient. For about one FTE salary equivalent, each year the Program supports at least six colloquies, offers about a dozen courses, brings four or five speakers to campus, and presents eight faculty luncheons. In addition, it hosts an annual reception

for second year faculty, holds a planning retreat, and gives an annual award recognizing contributions to interdisciplinary scholarship.

The colloquies are a distinctive feature of the University Studies program. University Studies Colloquies are interdisciplinary groups of faculty that meet regularly to explore a specific topic of mutual interest. University Studies supports ongoing colloquies by (a) paying the cost of obtaining materials for study, (b) supporting external visitors, and (c) facilitating communication with others who might be interested. The outcomes of colloquies vary. Some (a) continue as ongoing faculty development activities, (b) sponsor (often with University Studies support) conferences of national or international scope, (c) lead to the offering of courses, often team taught, with an interdisciplinary focus. Undergraduate courses are typically collaborative and transdisciplinary offerings presented by university studies faculty.

Institute for the Arts and Humanities, UNC-Chapel Hill
Supporting an interdisciplinary community of teachers and scholars, the Institute helps professors communicate the themes of the arts and humanities to students, University alumni and citizens of the state. Recognizing that scholars in the arts and humanities were at a relative disadvantage for research funding and that new configurations of knowledge demanded interdisciplinary collaboration, the Board of Governors of the University of North Carolina system approved the establishment of the Institute for the Arts and Humanities as a part of the College of Arts and Sciences. The Institute occupies its own building, Hyde Hall, which was built entirely from private gifts and donations.

The Faculty Fellows Program provides a setting for the exchange of new ideas through collaborative work with colleagues from various disciplines and all ranks. Once selected to be a Fellow by the Faculty Advisory Committee, the faculty member joins an expanding community of artists and scholars in the College. The Institute continues to support the work of its Fellows through a proposal assistance service (for outside funding for fellowships and projects), summer fellowships, conferences, lectures, workshops, exhibits, and performances.

4) Support Network

Creation of this network pools the existing resources of the university into a virtual—if not actual—center for coordination of cross-unit collaboration. The goal is to replicate the organization one might expect from a single administrative or academic unit by coordinating the efforts of several units for the common support of interdisciplinary and team teaching.

Appendix VIII: Methods for Evaluation

The Task Force suggests that there be a thorough evaluation plan for the new initiative to create interdisciplinary, team-taught courses or programs. The evaluation plan should focus on four elements: students' learning outcomes, the success of specific courses, and the benefits of the program as a whole in both the short and long run. Funding for the new initiative should include incentives for faculty to document the results of their teaching. Such documentation could induce other faculty to co-teach interdisciplinary courses as well as to demonstrate returns on the University investment.

General guidelines

Having affirmed the need for faculty to identify their own goals for student learning, it is vital here to identify some of the challenges that inhere in undergraduate teaching, that make interdisciplinary teaching so valuable, and that make interdisciplinary courses much more difficult to design for undergraduate students than for graduate students. Undergraduates' intellectual development involves many leaps and shifts, as their analytical skills are built through practice. Their engagement with subject material enhances their potential success (Leamnson 2000: 38-39; cf. Bransford, et al., eds. 2000), but most undergraduates learn, in the course of their years at the university, to distinguish personal and analytical perspectives, change their ideas of what an "argument" is, become able to understand and distinguish others' frames of reasoning, and to develop and defend their own reasoning (King and Kitchener 1994). Shifts from binary thinking (that often characterizes students just out of high school) to critical appraisal do not occur within the span of one semester. And in any given classroom of undergraduates, the range of intellectual development is daunting.

While specific course requirements remain always the purview of faculty members, and while having clear goals for student learning is always best for students, those faculty team teaching interdisciplinary courses must make special efforts to clearly identify the learning goals in these courses. In course design, faculty can benefit from Benjamin Bloom's taxonomy of thinking to help students reach higher levels of thinking when working with new information: acquisition of basic information, developing comprehension and using information in new contexts, application of concepts and theories as in problem solving or case studies, analysis of the patterns and components of ideas, synthesizing new ideas, and evaluating ideas (Bloom 1984). But interdisciplinary study may require something more or something else, something that Julie Thompson Klein describes as "triangulation" among the breadth, depth, and synthesis of perspectives. Klein suggests that course design shift from more hierarchical sequencing to ordering that allows students to shuttle among different kinds of mental strategies (Klein 1996: 213-214). Especially where interdisciplinary courses expect students to "bring things together at the end," rather than building skills gradually, faculty may ask students to self-evaluate as they progress through the course, to help the faculty monitor the student learning processes.

Classroom interaction provides a crucial opportunity for student skills to develop, especially in a collaborative interdisciplinary course. Gurin, Dey, Hurtado, and Gurin documented that student interaction is essential to multicultural education (cf. Gurin et al 2002); many studies have documented the pedagogical success of undergraduates' interaction for any field (e.g., Meyers and Jones 1993, Miller and Groccia 1997, Qin et al. 1995). Interdisciplinary courses may thus be evaluated (in part) on the opportunities provided for student interaction in class, and on the documentation that can be offered on development of students' interactive skills. Faculty interaction that models dialogue, debate, negotiation, and other healthy interdisciplinary exchange should be acknowledged and documented (as best it can) for the great value such modeling gives to students.

Student Learning Outcomes

- Evidence of student learning tracks success of students with different kinds of background. (This may include different levels of analytical skills when starting the course, different social or experiential backgrounds, different academic preparation or intended majors.)
- Evidence of student learning documents students' success at one or more of the following, or comparable successes:
    - Identification of multiple disciplinary approaches, and their applications.
    - Articulation of how different approaches intersect in the field of inquiry.
    - Synthesis of approaches from multiple fields.
    - Production of problem-solving, creative, social organizational, or design work
    - requiring negotiation of multiple approaches.
    - Development of collaboration and negotiation skills.
    - Challenges to theories and methods across disciplinary boundaries.

Success of Courses and Collaborations

- Course has been approved as a regular offering in one or more departments or programs.
- Faculty time for the course has been allocated on a regular basis.
- Course is taught again by the original or another pair/ group of faculty.
- Teaching strategies should be documented as a resource for others, demonstrating successful collaboration strategies.

Course-level evaluations (Davis, 1995; CRLT, 2005)

1. ***Tests of general knowledge***: College outcomes
2. ***Tests of disciplinary knowledge***: Content-specific
3. ***Tests of specific intellectual abilities***: Critical thinking, communication, integration, etc.
4. ***Portfolios***: Collections of students work
5. ***Logs and diaries***: Student reflections on experiences with different viewpoints
6. ***Case studies***: Written or oral responses from students to cases that test ability to apply diverse perspectives
7. ***Visual representations***: Challenges students to display concepts and connections between ideas

8. ***Essays***: Defending a point of view using evidence synthesized from multiple sources
9. ***Critiques***: Evaluations of articles, etc. using multiple perspectives
10. ***Proposals***: Requests for funding for projects employing interdisciplinary methods of inquiry
11. ***Team projects***: Reports that require use of varied data and synthesis of disciplinary traditions
12. ***Panel discussions***: Participation in discussion where complex issues are debated
13. ***Reflection on Experiential Learning***: Oral or written accounts of learning from field trips, service learning, internships, or travel.
14. ***Creative works***: Artistic representations of issues, themes, ideas, or cultural patterns.
15. ***Role plays and simulations***: Planning, acting out, and then discussing issues raised in the exercise

The following is a list of criteria for measuring the success of the program on multiple levels.

Program-level evaluations

Success of the University Program – Short Run

- Significant increase in the number of undergraduate students taking interdisciplinary courses.
- Increase in the diversity of students taking interdisciplinary courses.
- Increase in the level of higher-level skills engaged in by students in interdisciplinary courses.
- Identification by undergraduate students of the value of multidisciplinarity to their learning in course-end Evaluation forms.
- Increase in the number of interdisciplinary courses offered
    - as introductory or gateway courses,
    - as capstone courses or senior seminars,
    - that meet other distribution requirements, and/or the number of departments and programs offering these.
- Increase in the number of faculty co-teaching interdisciplinary courses.
- Diversification of the faculty co-teaching interdisciplinary courses.
- Increase in the number of faculty teaching undergraduates who are from professional schools.

Success of the University Program – Longer Run

- Identification among graduates of the value of interdisciplinary learning experiences to their future work or study.
- Identification of interdisciplinary learning opportunity as reasons for incoming students' selection of U-M.
- Identification by faculty of the value of interdisciplinary co-teaching to their professional development, including research, teaching, mentoring and/or service.
- Increased co-teaching and mentoring by faculty in courses in addition to those funded by the Provost's or CRLT initiatives.