

To: Jeremy Haefner, Provost

From: RIT Collaboratory for Cross-Disciplinary Education Implementation Task Force

RE: Final Report

Date: December 21, 2010

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Thank you providing our task force with the opportunity to explore interdisciplinary teaching and learning with a goal of “How can RIT establish an institution-wide Collaboratory for Cross-Disciplinary Education?”

After reviewing best practice materials on interdisciplinary<sup>1</sup> teaching and learning, leveraging available RIT reports and surveys related to the subject, interviewing individuals engaged in interdisciplinary efforts at RIT and drawing on the expertise from the assembled task force, we offer the following preliminary findings, comments and recommendations for your review.

### Findings, Comments and Recommendations

To explore the establishment of a Collaboratory, our task force started with a review of potential interdisciplinary education goals. We examined their fit with RIT’s strategic direction and environment. The following emerged as top strategic intentions for RIT’s interdisciplinary initiatives:

- to **solve complex issues** that cannot be resolved within one discipline
- to **better prepare students for the workforce**, preparing them to look at problems from multiple dimensions and to teach skills that will enable them to create new solutions
- to **further develop students’ critical thinking** skills and increase student engagement
- to **teach team-building skills** and an **appreciation of diverse skills** and styles
- to be **more attractive to granting agencies, foundations, and donors**, which are increasingly requiring interdisciplinary focus
- to **further grow an Institute-wide community** and **connections between disciplines**
- to allow opportunities for **broader scholarly thinking and dialog**
- to **enhance collaborative research**.

Our task force found evidence that many good results are already being accomplished in interdisciplinary education at RIT today. Examples are included in our detailed report and in our website mock-up (<http://interdisciplinary.se.rit.edu>).

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<sup>1</sup> Our detailed report provides definitions for several educational approaches for working beyond individual discipline-based silos. Interdisciplinary, as the highest form of integrative education, is the term the task force chose to represent all of these approaches.

Unfortunately, varying levels of awareness exist across RIT successes, which may be limiting the ability to give proper credit to faculty, students and staff. A lack of awareness may also hinder the ability to further draw in others and properly support good initiatives over extended timeframes. In addition, based on the recent RIT Academic Affairs committee survey responses and interviews of key players across campus, some RIT faculty, staff and students would like to further engage in interdisciplinary efforts but do not know how to connect with interested parties and/or to find resources or overcome barriers. Some resources exist today to match interested parties but they are not well known.

The interdisciplinary environment at RIT is complex so we need to be especially careful as we consider organizational changes. Interdisciplinary initiatives occur at many different levels within RIT including between individuals, at Department and School collaborative levels, across Schools, in Institutes, with external parties and in the many other established RIT areas/centers including, but not limited to, the Center for Multidisciplinary Studies, the Center for Student Innovation, the Honors Program, Entrepreneurs Hall and Study Abroad. Questions were raised during our review about the need to establish further structure and overhead. With this in mind, we considered three potential structures as part of this review (a centralized, decentralized and hybrid model).

Based on our review, RIT's potential for interdisciplinary initiatives has been limited by barriers including issues with incentives for faculty tenure and promotion, traditional higher education culture, resources and, even just, course numbering. Our recommendations recognize that potential solutions will require policy changes, resource prioritization and relationship building over time.

Our attached detailed report seeks to document the intention of interdisciplinary initiatives at RIT, recommend organizational structure options, address barriers identified and further support new/broader initiatives. All recommendations are presented over three perspectives of time: short term, mid-term and long term. Our detailed report includes:

1. Introduction
2. Definitions and Intentions
3. Examples of What's Working Today at RIT
4. Summary of Obstacles
5. External Interdisciplinary Practices
6. Recommendations for RIT's Path Forward
  - 6.1. Better recognize existing successes
  - 6.2. Foster more collaboration
  - 6.3. Select flexible organizational structure
  - 6.4. Create a Collaboratory for Interdisciplinary Education and Innovation
  - 6.5. Continue the work of this Task Force

## Task Force Membership

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# **Overcoming Barriers to Interdisciplinary Education and Collaboration at RIT**

**A Report by**

**Collaboratory for Cross-Disciplinary Education  
Implementation Task Force**

**21 December 2010**



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# 1. Introduction

In RIT Without Walls: A proposal to establish the University Center for Multidisciplinary Studies, Dr. James Myers opens the proposal with:

There is a general consensus that barriers exist to intercollegiate collaboration on teaching and curriculum development across RIT. Common challenges include, but are not limited to:

1. The inability to release faculty from the college or departmental budget and associated performance metrics (such as credit hours generated).
2. Limited college and departmental resources to invest in experimental course development and pedagogy.
3. Difficulty in cross-listing courses and co-teaching courses.

The RIT community has begun to define the shared student experience and associated student learning outcomes we desire. Finding these common dimensions, and delivering on their promise, will **require the university to overcome barriers to collaboration and embrace new approaches to course delivery and development.**

As we will note in this report, several examples of interdisciplinary<sup>2</sup> collaboration at RIT already exist despite the existing barriers and the resulting challenges. While not everyone at RIT would agree with the "general consensus" presented above, the list of common challenges is probably familiar to most faculty, staff, and administrators who have sought to foster intercollegiate collaboration at RIT. We agree that it is essential that RIT make a commitment to overcome those barriers to collaboration. The question this Task Force is addressing is the best way to overcome those barriers.

This report begins by providing background material on interdisciplinary educational activities including definitions and intentions, a sampling of interdisciplinary activities already ongoing at RIT, a list of obstacles identified at RIT and at other institutions, and interdisciplinary practices at other institutions. The last section of this report describes a range of organizational structures for supporting interdisciplinary activities with a recommendation for a hybrid approach. We close with a collection of recommendations that our Task Force believes can help to foster interdisciplinary activities at RIT.

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<sup>2</sup> The Task Force chose to use the term interdisciplinary to represent all forms of activity crossing the boundaries of discipline-based silos.

## 2. Definitions and Intentions

As we explored interdisciplinary initiatives at Rochester Institute of Technology, we reviewed definitions and intentions.

### 2.1. Definitions

In preparing this report, Task Force members recognized the importance of defining different educational approaches that seek to integrate various disciplinary perspectives bearing on issues or problems being considered within a particular course. Four learning concepts are commonly referred to though often without clear differentiation as offered by Repko (2008):

***Interdisciplinary Learning*** - synthesis of two or more disciplines, establishing a new level of discourse and integration of knowledge.

***Multidisciplinary Learning*** - juxtaposition of disciplines that is additive, not integrative. The disciplinary perspectives are not changed, only contrasted.

***Transdisciplinary Learning*** - holistic schemes that subordinate disciplines, looking at the dynamics of whole systems, such as structuralism or Marxism.

***Cross-disciplinary Learning*** - a disciplinary view taken from the perspective of another; e.g., referring to examples of expressionism in literature in an art history class on expressionism.

The Task Force believes these learning concepts are not mutually exclusive, nor is one approach inherently better in all teaching circumstances. However, of the four learning concepts, Interdisciplinary Learning represents the highest, most desirable and primary form of integrative education that RIT should strive to support in its creation of a new Collaboratory.

Guiding our thinking in this matter, and to paraphrase Repko (2008), *interdisciplinary learning* as integrative synthesis often begins with a problem, question, or issue. It is a means of solving problems and answering complex questions that cannot be satisfactorily addressed using single disciplinary approaches.

Interdisciplinary initiatives are often described by the form or structure they take (e.g., team-teaching), the motivation behind them (e.g., to serve societal or employment needs), how the disciplines will interrelate (e.g., math will be taught *in the service of* chemistry), or by labeling the level of integration (e.g., from *borrowing* to *synthesis*).

The “interdisciplinary” term is sometimes used loosely to refer to cross-functional groups, but the mere presence of individuals from different disciplines does not signify interdisciplinary collaboration. Thus the term *interdisciplinary* is used variably as a concept, a methodology, a process, a way of knowing, and even a philosophy.

### 2.2. Intentions

Before defining an approach for RIT to use for interdisciplinary education, the Task Force felt that it was important to describe the motivations or intentions that RIT has for this effort. In

short, what is RIT trying to accomplish through interdisciplinary education? Answering this question can help inform the recommendations for how RIT should proceed.

We identified a set of ten strategic intentions that have been the motivation for other institutions to embrace interdisciplinary work and that apply particularly well for RIT given the institution's culture, environment and strategic direction to address through its interdisciplinary activities. The ten strategic intentions are as follows (listed in no particular order of importance):

#### **Ten Strategic Intentions for Interdisciplinary Teaching and Learning at RIT**

1. To **solve complex issues** that cannot be resolved within one discipline
2. To **be more attractive to granting agencies, foundations, donors**, which are increasingly requiring interdisciplinary focus
3. To **better prepare students for the workforce**, preparing them to look at problems from multiple dimensions and to teach skills that will enable them to create new solutions.
4. To **further develop students' critical thinking skills**
5. To **teach team-building skills and an appreciation of diverse skills and styles**
6. To **increase student engagement**
7. To **enhance research**
8. To **foster Institute-wide community building**
9. To **grow connections** among disciplines
10. To allow opportunities for **broader scholarly thinking** and dialog

### 3. Examples of What's Working Today at RIT

While many feel that all of our work is contained in isolated discipline-based silos, the reality is that, right now, at RIT there are a large number of activities that are interdisciplinary in nature. The task force identified the lack of communication about what we are doing currently as a shortcoming that leads to this perception of little interdisciplinary work happening at RIT.

We believe that improved communications can help in a number of ways:

- Highlight ways in which students, faculty, staff, and external friends can make **Connections**.
- Show the places on campus where **Collaborations** outside of discipline-based silos are taking place.
- Boast of the **Innovations** that our students, faculty, and staff have created.
- Discuss the broader **Transformations** that have come about because of RIT's interdisciplinary work.

Here are some of the interdisciplinary activities working today at RIT.

Connections	Collaborations
<ul style="list-style-type: none"> <li>• Center for Student Innovation <a href="#">People</a>, <a href="#">Groups</a>, and <a href="#">Projects</a> pages</li> <li>• <a href="#">Center for Multidisciplinary Studies</a></li> <li>• <a href="#">Honors Program</a></li> <li>• First Year Experience</li> <li>• Imaging Science Innovative Freshman Experience</li> <li>• Entrepreneurial Hall</li> <li>• <a href="#">Unlikely Partners</a></li> <li>• University Studies</li> <li>• Greater Rochester Entrepreneurs</li> <li>• Guest speaker series</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Sustainability Programs</a></li> <li>• <a href="#">Institute for Health Sciences, RIT &amp; RGHS Alliance</a></li> <li>• <a href="#">Academic Centers</a></li> <li>• PhD programs</li> <li>• Joint degrees, <a href="#">Double/Dual degrees</a> <ul style="list-style-type: none"> <li>○ MS in Medical Informatics</li> <li>○ BS in Engineering/MS Public Policy</li> </ul> </li> <li>• Center for Multidisciplinary Studies</li> <li>• Honors</li> <li>• Co-ops</li> <li>• Capstone/Senior Projects           <ul style="list-style-type: none"> <li>○ KGCOE Multidisciplinary Senior Design</li> <li>○ <a href="#">Software Engineering Senior Project</a></li> </ul> </li> <li>• Team-taught Courses           <ul style="list-style-type: none"> <li>○ COS Frontiers in Science</li> </ul> </li> <li>• <a href="#">Laboratory for Environmental Computing and Decision Making</a></li> <li>• Sustainable Print Systems Laboratory</li> <li>• Vignelli Center</li> <li>• Multidisciplinary Vision Research Laboratory</li> </ul>

Innovations	Transformations
<ul style="list-style-type: none"> <li>• <a href="#">Imagine RIT</a></li> <li>• The Simone Incubator</li> <li>• Competitions               <ul style="list-style-type: none"> <li>○ Baja buggy</li> <li>○ Simone Center for Entrepreneurship</li> <li>○ RIT 48</li> <li>○ Shark Tank</li> <li>○ Business Plan Competition</li> </ul> </li> <li>• <a href="#">Research Highlights</a></li> <li>• <a href="#">Entrepreneurial Hall</a></li> <li>• Geospatial Intermodal Freight Transportation (GIFT) Model</li> </ul>	<ul style="list-style-type: none"> <li>• NTID - equipment lab for Deaf</li> <li>• National/International competition Winners</li> <li>• <a href="#">Lego League team</a></li> <li>• <a href="#">Habitat for Humanity</a></li> <li>• <a href="#">First Robotic Competition</a></li> <li>• Rochester Scholars</li> <li>• <a href="#">Project Lead The Way</a></li> </ul>

## 4. Summary of Obstacles

Material in this section is based on prior research on barriers to collaboration (Bohen and Stiles 1998) and the results of a RIT faculty survey conducted by RIT's Institute Effective Teaching Committee in 2008. The results of the RIT survey are presented in Figures 4.1 and 4.2.

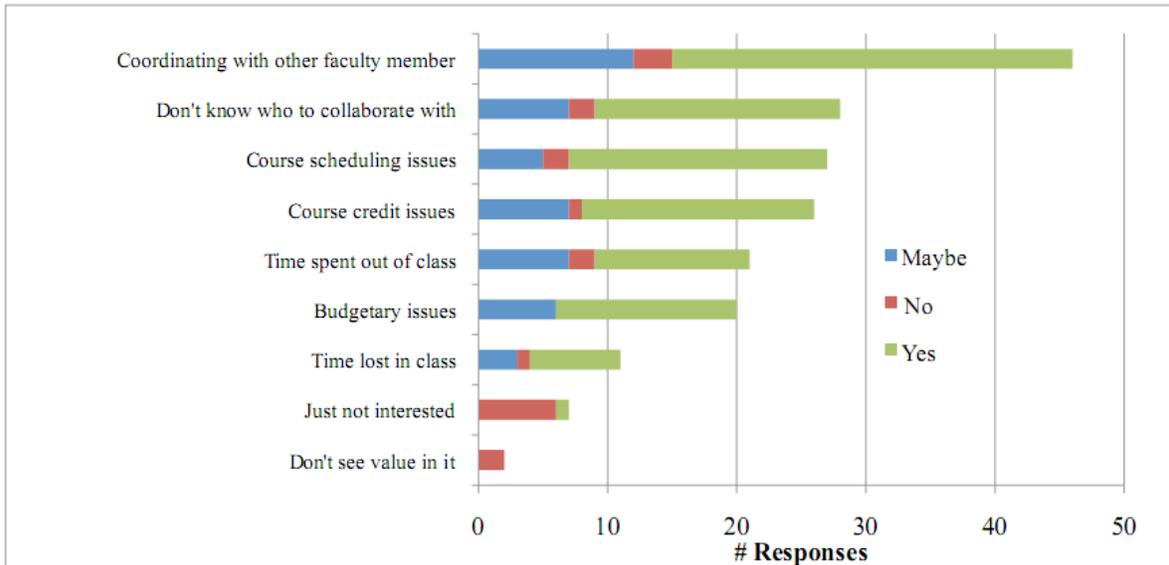


Figure 4.1: Challenges to pursuing cross-disciplinary collaborations, sorted by response to "Are you currently interested in pursuing cross-disciplinary collaboration?" (n=98) (RIT IETF, 2008)

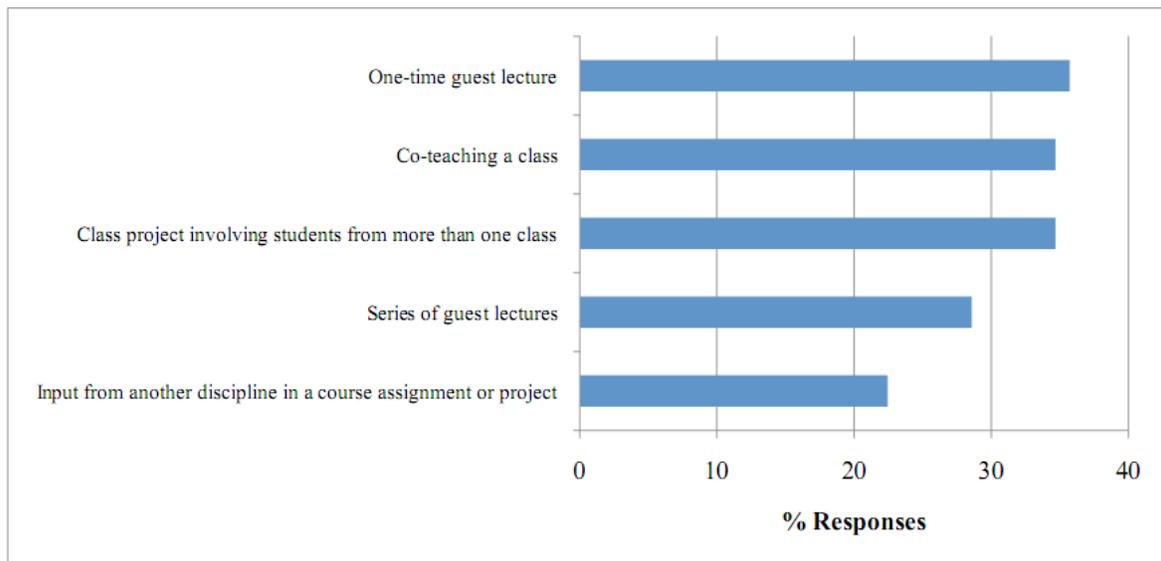


Figure 4.2: Types of collaboration respondents want to pursue (n=87) (RIT IETF, 2008)

For this analysis, the barriers to collaboration, identified in the prior research<sup>3</sup>, have been aggregated into four main categories shown below. Several barriers are included in multiple categories, as often these barriers are multi-faceted, with aspects fitting into different categories.

#### 4.1. Organization/Structures

- *Incentives/Rewards* -- Systems and decisions (e.g., tenure and promotion) tend to place a heavier value on individual actions so as to avoid subjective evaluation of the individual's level of involvement and influence in the collaboration. As a result, a significant obstacle are concerns regarding how collaboration will be recognized during tenure and promotion deliberations, particularly since collaborative initiatives are new, and may not be initially successful.
- *Course Credit* -- Faculty are required to teach a certain number of classes. Many times, faculty who participate in collaborations add this responsibility on top of their traditional academic work (Bohen and Stiles 1998). A joint credit system may be possible, but could add significant complexity. The institute must also ensure that these changes do not negatively affect course offerings by reducing the number of courses taught by faculty. Added to this are the following obstacles:
  - Difficulty in cross-listing courses and co-teaching courses.
  - The inability to release faculty from the college or departmental budget and associated performance metrics (such as credit hours generated).
- *Decentralized decision making/ Accountability* -- Departments make curriculum decisions for their majors/concentrations and are responsible for ensuring their faculty are held accountable to those standards. A real concern is how will department teaching needs be met if faculty members are teaching across disciplines?
- *Organizational structures* -- Structures that are too bottom-up can't garner needed resources or link with institution-wide strategic initiatives. Alternatively, structures that are too top down can't effectively maximize flexibility for faculty/staff innovation.
- *Effectively leveraging existing collaborations* -- Interdisciplinary programs already exist, but it can be difficult to represent an institution's entire portfolio effectively to external parties quickly when a potential new opportunity emerges. Likewise, it is difficult to leverage current programs internally to recognize economies of scale to use resources more efficiently, or to connect interested parties.
- *Course registration mechanisms* - The current RIT student system limits the capabilities to list courses in multiple ways, which limits the institution's ability to market courses, students' ability to find interdisciplinary courses and the ability to quickly look-up what faculty and staff are involved in interdisciplinary initiatives to match specific funding opportunities.

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<sup>3</sup> Kezar, A. and Lester, J. 2009. Organizing Higher Education for collaboration: A guide for campus leaders. John Wiley & Sons, Inc.

## 4.2. Resources

- *Lack of networks to facilitate new efforts*- Faculty who are interested in pursuing collaborations most typically cited "Coordinating with other faculty members" and "Don't know who to collaborate with" as challenges in the survey.
- *Lack of resources to facilitate new efforts* - Faculty, staff and students often are limited in their capability to reallocate existing funding or to go after new funding (see organizational structures comment above).
- *Sharing resources*--There is a lack of clarity on how to best share interdisciplinary support and infrastructure (e.g. administrative support, computing environment and labs). For financial resources - who is responsible for managing and allocating shared resources?
- *Course Credit* - Mechanisms do not exist to allocate faculty and departments credit for co-taught classes. There needs to be a way to have joint credit across participating schools (Issue was also raised in Organization/Structures). This is addressed directly in the survey by the "Course credit issues" question, but also indirectly by the questions relating to time, as it puts greater demands on the faculty members' time.
- Limited college and departmental resources to invest in experimental course development and pedagogy.
- Resources to train faculty on how to establish networks and coordinate with other faculty members.

## 4.3. Facilitation/Implementation

- *Initiative demand* -- There are fears that there will not be a high enough student and/or faculty demand for a collaborative initiative.
- *Appropriate initiative time frame*- Need to determine appropriate length of time for the initiative.
- *Role ambiguity* -- Collaboration participants need to know their role, expectations and how they who will be accountable for what.

## 4.4. Psychological/Cultural/Political

- *Paradigmatic differences*- (hard science vs. soft humanities) there are certain differences in how research is approached in different departments. For example, between quantitative analysis compared to theoretical development based on observation. This is more of a research concern than teaching concern.
- *Silo mentality*- Separate schools and administration, as well as a decentralized structure, may promote a culture that focuses on the need to compete for institute resources.
- *Room for experimentation*- The administration may have to develop creative solutions, with unforeseen consequences, meaning there must be room for error.

## 5. External Interdisciplinary Practices

Our review of the higher education landscape revealed that other academic organizations are also working on efforts to enhance interdisciplinary teaching and learning on their campuses. Some of the methods these other institutions are using include:

### **Leveraging relationships to grow new interdisciplinary capabilities and results**

- Establishing/growing relationships with established interdisciplinary organizations such as the Santa Fe Institute or HASTAC (see more details below).
- Leveraging local corporate and business/entrepreneurial relationships in support of interdisciplinary efforts (Note: RIT already participates in Rochester Business Alliance, Electronic Business Association and Rochester Angel Network for Entrepreneurs).

### **Fostering interdisciplinary cultures**

- Establishing institution-wide lecture series and other “meet and greet” opportunities targeted at broad audiences and focused on interdisciplinary topics to highlight current progress and new potential. This creates opportunities to foster new relationships and collaborations.
- Creating a flexible umbrella structure for interdisciplinary efforts to increase internal idea sharing and better market accomplishments. One example is Duke’s interdisciplinary studies web site (<http://interdisciplinary.duke.edu>).
- Growing closer relationships between academic affairs and student affairs to improve the student experience.

### **Supporting interdisciplinary teaching and learning start-ups and on-going initiatives as a priority**

- Supporting interdisciplinary capstone projects. An example is EPICS (Engineering Projects in Community Service), which comes complete with curricular materials for schools interested in becoming an EPICS site with. More details are given below for this example.
- Co-teaching courses, using service and experiential learning processes including first-year experiences, honors and study abroad programs
- Creating cooperative experiences across disciplines
- Designing team projects across disciplines and casting a wide net for participants—faculty, staff, students, alumni and friends of the institute—often over summer or winter breaks and targeting a specific society concern.
- Creating and supporting interdisciplinary learning communities focused on specific areas of interest.
- Coordinating seed funding competitions/incubators to support the start-up of new interdisciplinary projects.
- Establishing shared meeting and virtual spaces for idea sharing. Establishing new connections for community members. This includes physical sites such as Centers, Institutes and virtual opportunities using technologies such as databases tracking interest areas.

A few examples are listed below with their web marketing:

**Santa Fe Institute** (from <http://www.santafe.edu/about/> )

**The Santa Fe Institute** is a private, not-for-profit, independent research and education center founded in 1984, for multidisciplinary collaborations in the physical, biological, computational, and social sciences. Understanding of complex adaptive systems is critical to addressing key environmental, technological, biological, economic, and political challenges.

Renowned scientists and researchers come to Santa Fe Institute from universities, government agencies, research institutes, and private industry to collaborate in attempts to uncover the mechanisms that underlie the deep simplicity present in our complex world.

**HASTAC** (from <http://www.hastac.org> )

HASTAC - Humanities, Arts, Science and Technology Advanced Collaboratory ("haystack") is a network of individuals and institutions inspired by the possibilities that new technologies offer us for shaping how we learn, teach, communicate, create, and organize our local and global communities. We are motivated by the conviction that the digital era provides rich opportunities for informal and formal learning and for collaborative, networked research that extends across traditional disciplines, across the boundaries of academe and community, across the "two cultures" of humanism and technology, across the divide of thinking versus making, and across social strata and national borders... HASTAC is open to anyone...Once registered, you can contribute to the community by sharing your work and ideas with others in the HASTAC community, by hosting HASTAC events online or in your region, by initiating conversations, or by working collaboratively with others in the HASTAC network....Many of our members are academics or others affiliated with universities at any stage of their careers, from students to senior professors. Other HASTAC community members are public intellectuals, artists, citizen journalists and scholars, educators, software or hardware designers, scientists specializing in human-computer interfaces, gamers, programmers, librarians, museum curators, IT specialists, publishers, social and political organizers and interested others who use the potential of the Internet and mobile technologies for new forms of communication and social action. Specializations include the full range of the humanities and social sciences, the arts, music, new media arts, journalism, communications, digital humanities, cultural studies, race, gender, and sexuality studies, and global studies, as well as all computational fields, visualization and auditory sciences, information science, and engineering, plus those interested in intellectual property issues, and those concerned with social entrepreneurship, philanthropy, and public policy on a local or global scale.

## The Evergreen State College

(from <http://www.evergreen.edu/about/curriculumoverview.htm> )

- **Students enroll in a single, comprehensive "program" rather than a series of separate courses.** You'll explore many aspects of a theme or topic through different but related academic subjects. By tackling topics in an interdisciplinary way, you'll learn not only about a broad range of subjects and issues; you'll also become a critical thinker and a skilled communicator.
- **It's New and Different, Dynamic and Relevant** That's because every year we create a fresh, topical and engaging curriculum. At Evergreen, you often find yourself studying across several academic disciplines – all at once – and all in the same class. Imagine exploring psychology, environmental studies, math, history and economics and how they all interrelate. This amazingly rich intellectual journey is led by a team of professors---not just a single instructor.

Purdue's EPICS ([from https://engineering.purdue.edu/EPICS/About](https://engineering.purdue.edu/EPICS/About) )

### Overview

Community service agencies face a future in which they must take advantage of technology to improve, coordinate, account for, and deliver the services they provide. **They need the help of people with strong technical backgrounds.** Undergraduate students face a future in which they will need more than solid expertise in their discipline to succeed. They will be expected to work with people of many different backgrounds to identify and achieve goals. **They need educational experiences that can help them broaden their skills.** The challenge is to bring these two groups together in a mutually beneficial way. In response to this challenge, Purdue University has created **EPICS: Engineering Projects In Community Service.**

EPICS is a unique program in which teams of undergraduates are designing, building, and deploying real systems to solve engineering-based problems for local community service and education organizations. EPICS was founded at Purdue University in Fall 1995.

### EPICS Students

In the 2008-2009 academic year, over 2,500 Purdue students from 19 different departments participated on over 250 multidisciplinary teams. Over 5,000 students have participated in EPICS to date. EPICS programs have been founded at 18 other universities nationwide (including Puerto Rico) and in New Zealand.

## 6. Recommendations for RIT's Path Forward

The Task Force believes three steps should be taken to move interdisciplinary education forward at RIT. The three steps, which would be overlapping rather than strictly sequential, are:

1. Recognize interdisciplinary activities already happening at RIT. Make RIT people aware of these activities to generate increased interest and excitement. When pursuing external funding sources, it would be helpful to have a central showcase for our interdisciplinary efforts
2. Begin implementing recommendations that can foster more collaboration. Start with the easier short-term activities and as momentum builds move to the larger ideas.
3. Create a Collaboratory for Interdisciplinary Education and Innovation that will be a focal point for activities and resources for interdisciplinary education.

The following sections describe the Task Force's ideas for these three steps.

### 6.1. Better recognize existing successes

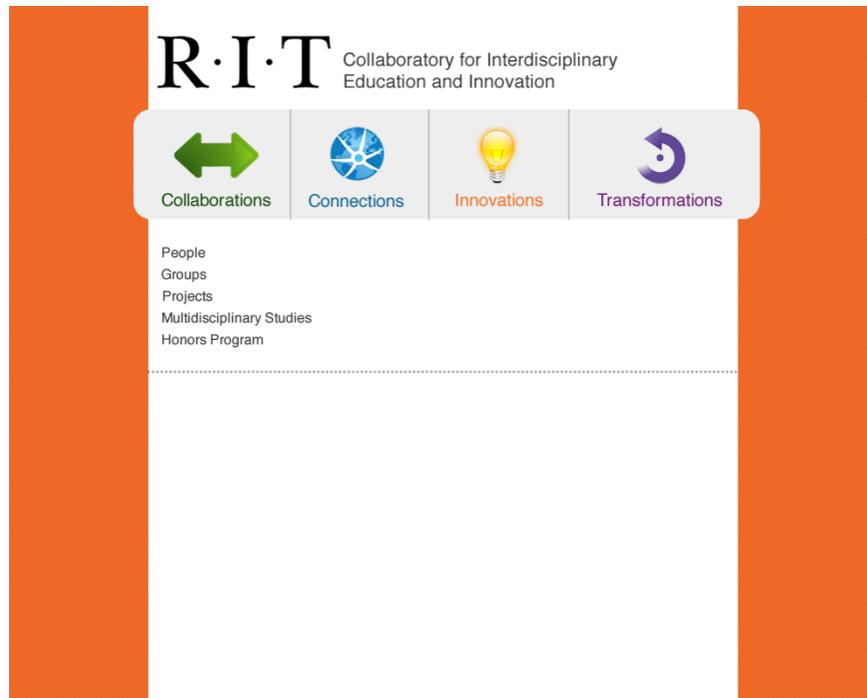
A primary vehicle for enhancing communication should be a website that aggregates all of the interdisciplinary activities at RIT. We have seen several other institutions that have such sites, for example Duke University (<http://interdisciplinary.duke.edu> which is shown in Appendix D). We created a mock-up of a website serving as a single point of information about interdisciplinary work. This example has received no critical evaluation by anyone, and it certainly does not contain all the activities and information that would be contained on a carefully prepared website. You can find this mock-up at <http://interdisciplinary.se.rit.edu> or <http://collaboratory.se.rit.edu>. An image of this rudimentary site is shown as Figure 6.1.

### 6.2. Foster more collaboration

This section describes a broad range of programs and policies that the Task Force feels would foster more interdisciplinary collaboration at RIT. To the extent possible and appropriate, we provide an implementation timeline, resource needs, and administration requirements. A table showing the mapping of these recommendations to the previously identified obstacles is given as Appendix B. A table of financial resources needed for these recommendations is given as Appendix C.

#### 6.2.1. Continue work thinking about the full range of interdisciplinary education

This task force has identified intentions and obstacles. This section suggests short-term and long-term recommendations to foster collaboration across the disciplines. The following section defines a possible structure for a Collaboratory for Interdisciplinary Education and Innovation that will be an Institute-wide resource and focal point for interdisciplinary work. This is a small insertion of momentum into the RIT system. To build on that, faculty, staff, and students need to continue not only doing the interdisciplinary work they already are, but also to continue the work of this Task Force to implement these recommendations.



1.1.1 Figure 6.1 Mock-up of a Collaboratory website

The Task Force is aware of a separate group that is looking at the charter for the Center for Multidisciplinary Studies, but work on interdisciplinary education that covers the full range of learning concepts defined in Section 2.2 is broader than the scope of that group. As you will see from the recommendations in this section and the proposed Collaboratory described in Section 6.4, it cuts a wider swath across the RIT landscape. With this in mind, we recommend that the Provost/Academic Senate charge an on-going committee to:

- advance interdisciplinary initiatives covering the full breadth of activities defined in Section 2.2 across the institution,
- create and update communications about interdisciplinary initiatives to promote more awareness and engagement from an institution-wide perspective (such as organizing and reporting on the progress of the speaker series and creating and updating the website) and
- help faculty, staff and students to overcome barriers to interdisciplinary collaborations even as they change and evolve over time.

**Administrative Needs:** Deans, Department Heads and Student Leaders will need to appoint faculty, staff and student representatives from across campus to participate in this committee.

**Resource Needs:** No incremental costs are associated with this recommendation.

### **Timeline:**

**Short term (< 1 year)** To help continue to foster interdisciplinary collaborations across the campus, the Provost/Academic Senate should charge the new committee. The Committee should seek to gather more input from across campus about what successes are already occurring. They should plan the website content and how it will be regularly updated and work with the technical resources to launch it. The group should gather an inventory of guest speakers that are expected to come on campus for open-invite engagements. They should review the speaker list and topics to determine if some of the speaker engagements can be linked around interdisciplinary themes to create the start of the new, integrated interdisciplinary speaker series.

**Mid Term (1-3 years)** The committee should gather and promote interdisciplinary accomplishments to encourage new connections and collaborations and encourage mentoring where appropriate. They should continue to advance marketing efforts for interdisciplinary efforts, drawing in alumni and community members as appropriate.

**Long Term (3+ years)** The committee should assess progress made to date on interdisciplinary initiatives and determine where changes in policy, organization structure and procedures need to be made to further advance the potential for the entire institute.

### **6.2.2. Create a Think Tank for Defining Interdisciplinary Strategic Direction**

This should be a high-level think tank comprised of RIT personnel and External members (Visionaries) who can suggest strategic direction for RIT annually that can serve as idea generators for interdisciplinary curricula and research. This think tank will be guided by roadmaps in the various professional fields and also the wealth of experience its members will bring.

The Think Tank would be under the auspices of the Associate Provost for Interdisciplinary Education and Innovation (IE&I) (Section 6.4). It would be the Associate Provost's equivalent to the Advisory Boards that most Deans have.

**Administrative Needs:** Administrative support provided by the Associate Provost for IE&I

**Resource Needs:** Funds to support travel and hospitality for once or twice a year meetings of the Think Tank.

### **Timeline:**

**Short term (< 1 year)** As soon as the Collaboratory is put in place, advisors could be invited to join the Think Tank and begin meeting.

### 6.2.3. Create Cross-College Networking Events

Create the opportunity for periodic networking events that allow individuals from across campus to learn about their colleagues' research and teaching efforts, such as the Imaging Bash hosted by the Center for Imaging Science. The events should be held in diverse locations and be spread across various time patterns to reach a broad range of attendees. The events should be open to faculty, staff, students, alumni, friends of RIT and community members as appropriate. The events should be prominently featured on the Collaboratory web site.

**Administrative Needs:** An administrator to schedule nine to twelve seminar series events per year. Could use existing events in a more integrated way.

**Resource Needs:** This could be started with a pilot seminar series 12 events x \$50 each = \$600 to highlight existing RIT interdisciplinary efforts and resources. Potential source of funds is to seek development dollars for the year to have the series named for a vendor partner or Alum.

#### **Timeline:**

**Short term (< 1 year):** Highlight RIT's existing efforts to gain broader involvement and to allow for networking during event. Market the success of the event (for example photos on website and given to sponsor).

**Mid Term (1-3 years):** Add external parties to the agenda to highlight what is occurring at other institutions, organizations or vendors that might foster increased interdisciplinary teaching and learning or new collaborations. Seek additional development support dollars based on success of early efforts.

**Long Term (3+ years):** Seek dedicated space to promote networking. This has been raised in the past in the form of a request for a University Club but could take a broader shape to be a forum for faculty, students, staff, alumni, local business owners and other friends of RIT. With respect to a University Club, faculty have identified in past surveys that an important barrier to cross-disciplinary teaching and research is the absence of a "place" at RIT where faculty can get together to eat, talk, socialize, and intellectualize in a casual atmosphere. The benefits of an RIT University Club are many, including the opportunity to host interdisciplinary events, research talks, and speakers. But, perhaps as important, a University Club brings faculty (and staff) together in a way that builds networking capacity – one of the most important elements of successful interdisciplinary education. We recommend that the Institute consider in its next capital planning discussions a University Club that provides access to faculty, staff, alumni, friends of RIT, and corporate visitors to allow for greater potential for new collaborations and idea sharing.

#### 6.2.4. Grow Support for Interdisciplinary Educational Initiatives

Interdisciplinary teams are the best means to address the most difficult problems, "wicked problems" to quote President Destler. Society is looking to universities for answers to these, everything from global climate change to life-threatening diseases, and it is only by working together across disciplines that these can be addressed. In both teaching and research, interdisciplinary endeavors should be "preferred activities" that are given priority and supported through annual plans of work, merit review, tenure and promotion decisions. In addition, to foster growth, internal funding opportunities should be made available.

There are a number of project types that internal opportunities should consider funding.

- The new General Education curriculum provides opportunities for faculty to collaborate within and across colleges in the delivery of multi-perspective courses. For example, faculty could jointly teach courses that addressed one or more of the seven "perspectives" in the sophomore year. Interdisciplinary General Education Concentrations could also be developed. These should be 'preferred activities', and might attract some funding for course development. Collaboration among faculty from more than one college to deliver such courses and concentrations should have a higher priority for funding than more local initiatives.
- Creation of Interdisciplinary Minors. These would arise naturally from the interdisciplinary concentrations already proposed. Again, two or more faculty from different colleges and units could be encouraged to collaborate in designing such minors.
- Create a Provost's Intercollegiate Collaboration Fellowship where faculty from two or more RIT colleges proposing a new topic for thesis-based MS or Ph.D. research may request tuition and stipend support for a graduate student from the Provost's Intercollegiate Collaboration Fellowship.

**Administrative Needs:** Minimal, as most of these ideas would arise from faculty initiatives. Requests for supplementary support would normally be directed to the Associate Provost for Interdisciplinary Education and Innovation.

**Resource Needs:** Faculty within a college would develop new interdisciplinary courses as part of their annual plan of work, and this need not require additional resources. Faculty from more than one college who developed a new interdisciplinary course/concentration/minor would benefit from cash support to work over a summer. Such a "preferred" activity might attract funding of \$3,000 to \$4,000 for each such endeavor.

The proposed Provost's Intercollegiate Collaboration Fellowship would require more substantial support: tuition (\$33,234 this year) and stipend (a maximum of \$20,000).

## Timeline:

**Short term (< 1 year)** Pilot courses for the new General Education curriculum could be developed beginning in the next academic year.

**Mid Term (1-3 years)** Concentrations and minors might take a little longer, say one to three years.

**Long Term (3+ years)** These initiatives should continue into the indefinite future, with new ones being developed and others modified or dropped.

### 6.2.5. Initiate an Interdisciplinary Faculty Classroom Speaker Program

The Interdisciplinary Faculty Speakers Program provides an opportunity for faculty teaching in one discipline to access faculty from other disciplines to provide relevant lectures or learning activities in his/her classes. The program consists of identifying a pool of faculty each quarter who can be called upon by faculty in other programs to give course lectures. For example, a faculty member teaching a course in engineering may want to access a faculty member from public policy to provide a lecture on the role of public policy in engineering. The “faculty speakers” (making up the pool) would be identified in the previous academic year and would be “reserved” at least one quarter prior to the quarter for which they are being requested. One source of these speakers will be faculty who are co-teaching courses, with a suggestion to make sure they get guest lecture time in the courses that would be prerequisites for the co-taught class, to promote enrollment. Another source could be faculty given release time to focus on this speaker program and other interdisciplinary activities. Faculty who get course release to team teach courses would be the speakers in this classroom speaker program. Typical visitation may last one or two periods, and involve lecture, readings, student group work, discussion, or other relevant interdisciplinary education and learning activities. It is expected that both the faculty requesting the speaker and the speakers themselves conduct some level of pre-lecture coordination. A website that identifies the faculty speakers for a given year will also provide a directory and reservation system.

This program could be coordinated with the upcoming “University Professor” proposal. Faculty receiving that honor could be given the option to participate in the program.

**Administrative Needs:** This initiative will be managed by the Educational Incubator in the proposed Collaboratory.

**Resource Needs:** Departments from which faculty are drawn will receive funding for adjunct hires to cover course delivery gaps. Approximate resources for an initial roll-out of 10 faculty members in the pool per quarter would be approximately \$120,000 (10 faculty/quarter \* \$4,000/faculty \* 3 quarters). An additional \$10,000 would be needed for administrative costs and website development.

**Timeline:**

**Short term (< 1 year)** Plan for the initiative.

**Mid Term (1-3 years)** This initiative can be rolled out in Fall 2011 with full implementation by Fall 2012. Academic year 2011-12 will be used to set up the system, procedures, and processes. Academic year 2012-13 will be used to demonstrate the initiative with a collection of 10 faculty per quarter.

**Long Term (3+ years).** Assess and fine-tune initiative as needed.

**6.2.6. Grow Honors Program Interdisciplinary Initiatives**

RIT's Honors Program has been a valuable element in attracting and retaining the university's best students. The presence of honors students in the classroom and on campus helps to raise the level of academic achievement for the entire student body, provides an avenue for increased faculty involvement, and enhances RIT's reputation as a world-class and globally competitive university. The Honors Program's rigorous and innovative academic environment attracts and retains top students through graduation, and also establishes a campus environment which provides exciting opportunities for all RIT students.

**Administrative needs:** Overseen by existing Honors leadership.

**Resource Needs:** No additional resources beyond adjunct salaries required (as is the current practice), as faculty who currently teach honors courses can apply to be affiliated with the Collaboratory.

**Timeline:**

**Short term (< 1 year)** Develop marketing or branding strategy for Honors Program as interdisciplinary program, with emphasis on: interdisciplinary studies, research, global education (funding available), career and professional orientation, preparation for graduate and professional studies and focus on academic excellence, indicated by awards, grants, and fellowships received by honors students

**Mid Term (1-3 years)** Develop Honors Program Interdisciplinary Curriculum (integrating more than one discipline), develop honors interdisciplinary research minor and develop honors interdisciplinary courses and seminars (open to all RIT students with a 3.4 GPA or approval of professor).

**Long Term (3+ years)** Fully developed Honors Interdisciplinary Curriculum, provide interdisciplinary research opportunities to all RIT students, Honors presence on RIT's global campuses.

### 6.2.7. Further leverage interdisciplinary learning communities

Develop interdisciplinary learning communities (LC) – Students would enroll as a cohort in two or more classes in which the faculty integrate the curriculum for a deeper, more intentional learning experience for the students. Integrating the curriculum allows the students to get a breadth of knowledge where the classes overlap as well as the typical depth of knowledge that the individual classes would offer on their own.

Learning Communities and Common Intellectual Experiences are both defined as High Impact Educational Practices by the AAC&U LEAP Initiative, and several other universities are using this strategy. National research also shows that LC's increase retention and GPA and students who participate tend to make a smoother transition to the university by quickly forming support networks and integrating into the university community.

Interdisciplinary LCs could be focused on first-year students but they do not have to be limited to that population. They also lend themselves well to upper-level General Education classes and capstone experiences. One example of an interdisciplinary LC for freshmen engineering majors would be calculus and physics. The same course material would be covered that would be in non-LC classes but the faculty would be able to show how the two are inter-related, specifically through an engineering lens. Another example that would be focused on freshmen of any major might be "Ethics in the Information Age" with "Science, Technology, and Values." For upperclassmen, pairings could easily be developed from the new General Education themes.

This Fall Quarter (20101), David Martins (CoLA) and Joe Pow (COS) offered coordinated sections of freshman *Writing Seminar* and *Innovative Freshman Experience* for first year students. This Spring Quarter (20103), Dr.'s Doolittle (Provost/COS) and Torcello (CoLA) will offer "Death and the Living: A unique Learning Community Model that Connects Issues of Biomedical Ethics to the Study of Human Anatomy". This LC will combine Dr. Dolittle's Human Gross Anatomy class with Dr. Torcello's Death and Dying class. This class is expected to attract "pre-med" students as well as students in the Physician Assistant, Diagnostic Medical Sonography, and Biomedical Sciences programs.

**Administrative Needs:** In our current set-up, the learning community program is managed by the office of the Assistant Provost for Undergraduate Education. With the development of interdisciplinary LC's, this would include reviewing and approving LC proposals, training the involved faculty and staff and summative assessment. Each LC however, would be responsible for developing its own learning outcomes, curriculum and assessment plan utilizing the appropriate campus resources (Asst. Provost for Undergraduate Education, The Teaching and Learning Center, Student Learning Outcomes and Assessment office, Student Affairs partners).

### Resource Needs:

- Support from the Teaching and Learning Center to promote innovative pedagogy and collaborative curriculum development
- Support from the registrar's office in order to schedule the classes together, reserve sections for LC students only, and possibly create one course number that will automatically enroll students into the required LC classes
- If small class size is crucial element for a core LC class, there may be a need for additional head count to supplement students displaced by smaller class size. If classes are currently running and co-enrollment is the only requirement, no additional headcounts would be needed.
- Budget for out-of-class and/or co-curricular activities such as field trips, community building events, etc.
- FTE for LC coordinator to assist Asst. Provost in managing the program

### Timeline:

**Short term (< 1 year)** Highlight existing initiatives such as those described above.

**Mid Term (1-3 years)** Roll out would be based on faculty interest, student need and scope of the project (single sections versus all first years in a major). The conversion to semesters and resulting curriculum conversion is a timely opportunity to develop interdisciplinary LC's. Faculty will have the opportunity to reconsider their pedagogy as well as links with other topic areas.

### 6.2.8. Interdisciplinary project activities across the disciplines

Projects requiring talents from multiple disciplines would be listed in the Project Clearinghouse (Section 6.2.9). These projects could be credit-bearing, or non-credit-bearing. Selection of project team members ideally would occur before the start of the term, but certainly need to be done quickly at the start of a term so that students can rearrange their schedules if a project falls through. Projects that will not be credit-bearing are not necessarily constrained by these term-calendar timelines.

Once a student identifies a project and is selected to be part of the team working on the project, the student will need to decide how to place credit-bearing project work in his or her program coursework. Free electives are always one option, and there should be an institute-level course number for interdisciplinary project work that will not be counted as course credits in a specific discipline. A student could register for this non-disciplinary project work, and the work would be overseen by the faculty who created the project. Programs would be encouraged to have a place in the curriculum for students to receive discipline credit for work on an interdisciplinary project. To ensure that the student's work was satisfactory for discipline credit, a faculty member in the discipline would most likely need to oversee the student's activities. The level of home program faculty involvement in the grading of the student's work could be variable based on the individual projects.

Programs might restrict the number of times a student could take an interdisciplinary project course and receive discipline credit.

Credit-bearing interdisciplinary project work is already done in pockets across campus. There are a few cross-college programs such as the New Media program between B. Thomas Golisano College of Computing and Information Sciences (GCCIS) and College of Imaging Arts and Sciences (CIAS). Within Kate Gleason College of Engineering (KGCOE), multi-disciplinary projects are a requirement for all programs and sometimes extend across colleges when students from Saunders College of Business (SCB) and GCCIS participate in project work. Software Engineering senior projects have SE students working on projects for sponsors who are mostly outside of their area of expertise. There are also isolated courses where interdisciplinary project work is a major component. These courses and other non-credit bearing projects will sometimes use the facilities of the Center for Student Innovation.

**Administrative Needs:** A simple start would only need someone to administer the project connection system. Once a project group is identified, the faculty who are associated with the project would run the project according to their local policies, or perhaps policies of a Collaboratory, if policies did exist.

**Resource Needs:** Faculty will need the time to oversee projects that they have created. Faculty in a program where a student receives discipline credit for project work would need time to oversee some number of those projects. Leading up to the project, a faculty member will need to be responsible for solicitation of project proposals.

#### **Timeline:**

**Short term (< 1 year)** As mentioned some of this is already going on across campus. Making interdisciplinary projects available to more students would require project courses to be created in individual programs or existing Independent Study courses could be used. Beyond that, Institute-wide advertising of the possibility for working on a interdisciplinary project is needed, along with the definition of the process for selecting projects and assigning students.

**Mid Term (1-3 years)** Create a list of requirements for the interdisciplinary courses, identify candidate projects, create course syllabus. Roll out first set of projects. Celebrate successes in part of speaking series and on website.

**Long Term (3+ years)** Assess program and fine tune as needed.

#### **6.2.9. Create a Project Clearinghouse - Opportunities for Collaboration Across Disciplines**

The first problem with working on an interdisciplinary project is connecting interested students with a project that matches the student's interests and skills. A technology solution should allow anyone to define a new project and specify the anticipated needs for that project. The needs could be for students, faculty collaborators, space, or equipment. A

Project Clearinghouse will provide a place for faculty to post projects that would benefit from student or faculty support from outside their home department/college.

All project postings will include discipline(s) sought, scope, type of involvement (e.g., single student for-credit project, classes working in parallel on projects, informal short-term consulting, or guest lectures) expected time commitment, expected outcome, and contact person. Project postings will be reviewed by a college/department representative to ensure reasonable expectations and appropriate matching of skill sets.

To assist in creating the requests for collaborators, a skills database should be created. The Skill Set Database will be a website that contains descriptions and examples of the types of work typically done by students and faculty in each discipline. It will include information similar to the Co-Op and Career Services office Program Info website, allowing faculty to target the appropriate disciplines when scoping projects and seeking collaborators.

This clearinghouse could easily be extended to include research projects as well as classroom-based educational activities.

Entering students could update the database annually by including YouTube-style 'faculty surveys' to orientation activities. This has been piloted recently as part of the *Innovative Freshman Experience* course in COS, where students were required to perform 'faculty expertise' surveys to identify faculty who were available to support their project.

**Administrative Needs:** Once established, this program will be monitored by a Collaboratory affiliated faculty member.

**Resource Needs:** A website will need to be created and maintained. The RIT wiki may also be an appropriate location for this. Maintenance will consist of (1) monitoring postings for appropriateness and project scope and (2) removing projects that are either closed or inactive for a predetermined period of time, and is not anticipated to be time-intensive.

Approximate costs associated with this would be time for one person to set up the site (one course credit @ \$4,000 for a faculty member, or staff equivalent, if it can be handled through an existing framework within Academic Technologies) and periodic monitoring, which could be part of the responsibility of faculty members assigned to another program, such as the Interdisciplinary Faculty Speakers. A simple version of such a database is running in the Center for Student Innovation. This would be an appropriate capstone project, such as, the Software Engineering Senior Projects.

#### **Timeline:**

**Short term (< 1 year)** The website can be opened up for posting in Fall 2011 and projects may begin any time after that, as agreed upon by all participants. A preliminary set of skill sets is already available on the Co-Op and Career Services website and a web link to this information can be available immediately. This information needs to be refined to be relevant to cross-disciplinary collaboration, which will take approximately a quarter.

#### **6.2.10. Expand Interdisciplinary Teaching and Learning through Merit, Tenure, and Promotion Criteria Revisions**

If interdisciplinary teaching and learning is to be emphasized at RIT, the criteria by which faculty are evaluated for merit review, tenure, and promotion need to be reviewed and revised as appropriate. This recommendation involves conducting a review at the College level to determine whether interdisciplinary activities are given fair consideration in comparison to individual research and teaching efforts. The recommendation would require that Dean of each College submit to the Provost a copy of the criteria guidelines used in their respective Colleges, with identification of how interdisciplinary activities are addressed. If no criteria explicitly address the importance of interdisciplinary activities, then the Dean would work with appropriate faculty committees at the College level to incorporate such criteria. Similarly, the Provost, through appropriate Academic Senate committees should review Institute criteria guidelines for merit, tenure, and promotion and determine whether an interdisciplinary statement should be included at the Institute level. Lastly, if individual Departments have evaluation criteria, each Dean should task Department chairs to conduct a similar review at the department level.

**Administrative Needs:** The Provost should task each Dean to review each College's merit, tenure, and promotion criteria and report back to the Provost on the role of interdisciplinary activities in these criteria. If there are no criteria related to interdisciplinary work, the Dean should begin the process of incorporating such guidelines in College documents. The Provost should also engage with the Senate on this issue and request the Academic Affairs Committee to review Institute guidelines. Lastly, Deans should charge Department Chairs to conduct similar analyses at the department level.

**Resource Needs:** Time needed for evaluation.

#### **Timeline:**

**Short term (< 1 year)** Conduct reviews by the end of the AY 2010-11

**Mid Term (1-3 years).** incorporate changes in appropriate guideline documents before the beginning of AY 2011-12.

#### **6.2.11. Review the RIT Cost Model and Other Resource Allocation Tools with Respect to Interdisciplinary Teaching and Learning**

One barrier of cross-disciplinary teaching and learning is the way in which student credit hours and teaching load are handled at the Department and College level. For example, if a Department Chair (or Dean) allows faculty members to team-teach courses with faculty from other disciplines, would these assignments only count as "half courses" from a resource-allocation standpoint? If so, would this then mean that the Department or College would experience a "half-course" resource shortage from the Institute's perspective? This recommendation involves developing a clearer set of guidelines and implications associated

with team-teaching cross-disciplinary courses. As part of this effort, an understanding of how team-teaching is currently viewed through the RIT cost-model or other resource allocation tools is needed. Once a set of guidelines is developed, the RIT cost-model and/or other resource allocation tools should be adjusted to reflect the importance of encouraging cross-disciplinary team-teaching.

**Administrative Needs:** The Provost, in cooperation with the SVP of Finance and Administration, should take the lead on the initial assessment.

**Resource Needs:** Limited resources are needed for the initial assessment; additional resources would be needed to allow for additional team-teaching on campus.

**Timeline:**

**Short term (< 1 year)** The initial assessment could be conducted this spring.

**Mid Term (1-3 years)** The AY 2011-12 could be used to identify a plan for modifying the cost model or other resource allocation tools to reflect the importance of cross-disciplinary team-teaching.

#### **6.2.12. Small Business Innovation Research Funding Model**

Almost all challenges to interdisciplinary work can be understood as symptoms of competition for limited resources. A clear indication that RIT is investing in interdisciplinary collaborations, and a visible shift toward *healthy competition* for the resources necessary to support those collaborations would be an efficient way to address these challenges head on.

- All US agencies with significant R&D budgets are required to set aside a small percentage of their budget for proposals from small companies to conduct innovative research that may benefit the public and have commercial promise ([www.sbir.gov](http://www.sbir.gov)). RIT could have a similar model; all budgeted RIT academic units (from departments through the Provost's office) would make a small fraction of their budget available for proposals from interdisciplinary groups to invest in collaborative educational efforts. The definition of 'collaborative,' the amount of funding available, and the use of the funding would vary depending on the level at which proposals were submitted. For example:
  - A group of students and faculty within a single department could propose the development of a new course in which two faculty would prepare and deliver the course as a team the first time. (Proposal at departmental level)
  - Two faculty members from different departments in one college could propose a new two-course sequence incorporating new developments in a field that would attract students across traditional departmental lines. (Proposal at college level)

- A group of faculty from multiple colleges could propose a new multidisciplinary concentration requiring the creation of several new courses in each college and the purchase of new laboratory teaching equipment. (Proposal at institute level)

**Administrative Needs:** There would be administrative needs at the various levels where the proposal was directed.

**Resource Needs: TBD**

**Timeline: TBD**

### **6.2.13. Increase priority to pursue new funding or reallocate existing funds for interdisciplinary initiatives**

Seek new funding through:

- Creation of a Corporate/Individual Donor Named speaker series concentrating on interdisciplinary education and innovation
- Establishment of a resource wish list on the Collaboratory web site and for development linked to a function. This could be especially useful in areas that we know we have local strength (such as asking for copiers/imaging equipment).
- Setting up auxiliary operation accounts for summer and winter break session interdisciplinary activities. The auxiliary operations structure already exists at RIT and allows for new activities to be set up with a break-even financial structure. This would allow the cost of teaching a new summer or winter break session to be included in the cost charged back where the fee amount could depend on the type of experience. Instructor travel could be included in the chargeback structure.
- Consider charging new fees for special interdisciplinary events and activities as appropriate.

Better leverage existing funds to promote interdisciplinary initiatives:

- Seek funding reprioritization for existing funds. This can be achieved through the leveraging of operating funds from changes such as faculty retirements and open positions as well as through debt management by gaining an understanding of key debt retirement dates that may pose opportunities for fungibility.

**Administrative Needs:** Administrative support is needed for the seminar series as already noted and to maintain the wish list of items. We expect this could be handled by existing administrative support. Provost and CFO discussions would be required to determine the feasibility of options.

**Resource Needs:** No incremental funds are requested.

## Timeline:

**Short term (< 1 year)** Seek development funds for the launch of the institution-wide interdisciplinary named speaker series. Start the resource wish list for the web site and share it with the Development and Co-op leaders so they can make corporate sponsors and friends of RIT aware. Set up auxiliary accounts as needed to support interdisciplinary projects over break terms. Have the Provost's Office request a summary of major bond retirement, including dormitory authority bonds (this is especially important given the age of RIT buildings and considering that many major bonds have a 30 year term). Have the Provost work with the CFO's office to determine if funds formerly collected for debt retirement might be available for interdisciplinary initiatives within the short or long term. Determine if funds from open positions and retirements can be fungible for interdisciplinary initiatives. Start to build new relationships with Development to better support Interdisciplinary initiatives from Alums and Friends of RIT.

**Mid Term (1-3 years)** Continue to review availability of funds and positions from faculty and staff attrition and debt retirement to determine if they can be made available for interdisciplinary initiatives. Seek new funding through auxiliary fees for interdisciplinary initiatives over break periods. Leverage the existing auxiliary operations financial structure to do so. Continue to grow specific development relationships in support of interdisciplinary initiatives. Market results of early new successes with likely development candidates. Plan for a specific ask targeting interdisciplinary efforts over the long term. Seek additional grant funding for interdisciplinary efforts leveraging the newly integrated presentation of the institution's successes. Increase campus awareness to interdisciplinary grant opportunities (the website could assist with this).

**Long Term (3+ years)** Continue to review availability of funds and positions from faculty and staff attrition and debt retirement to determine if they can be made available for interdisciplinary initiatives. Continue to seek new funding through auxiliary fees for interdisciplinary initiatives over break periods. Plan a specific Development ask in support of interdisciplinary initiatives. Grow grant and foundation support of interdisciplinary efforts through new connections from national memberships and better leveraging of the institution's interdisciplinary successes.

### **6.2.14. Leverage new Student Information System course numbering capabilities to overcome historical course numbering challenges.**

Due to the current aged student information system interdisciplinary courses have a limited number of ways they can be listed and used for reporting purposes. This reduces RIT's ability to market courses to students and to assess the impact of interdisciplinary programs. It also limits the ability to quickly look-up interdisciplinary courses or faculty and students engaged in interdisciplinary efforts, which may limit the ability to match efforts to specific funding opportunities as they arise.

According to the registrar the new SIS system will allow for course to be listed multiple ways to accommodate all reasonable requests. In addition courses can be listed with attributes. We recommend that an attribute should be "interdisciplinary" this would allow leaders to quickly search for key faculty with expertise in interdisciplinary collaborations and would allow for tracking and assessment.

**Administrative Needs:** Need key content builders to work with registrar on new numbering system.

**Resource Needs:** No incremental costs are associated with this recommendation. The Registrar would need to consider the interdisciplinary course codes and attributes in the new numbering system.

**Timeline:**

**Short term (< 1 year)** Plan course and attribute numbering system with registrar.

**Mid Term (1-3 years)** Introduce with go-live of new student system.

**Long Term (3+ years)** Assess numbering system. Report on interdisciplinary activity.

### **6.3. Select a flexible organizational structure**

The Task Force considered a spectrum of different organizational structures and approaches for enhancing interdisciplinary teaching and learning at RIT. It may be helpful to consider two “bounding cases,” not because one of the two must be chosen, but because it may help to highlight the benefits and costs associated with all options. At one extreme is a **Decentralized Model** in which no new administrative structure is formed to support new interdisciplinary educational experiences at RIT. Instead, resources are allocated through existing departmental, college, and institute structures to support those activities. At the other extreme is a **Centralized Model** in which a new organization is formed expressly to support these activities. The pros and cons of each of these bounding cases are discussed below.

#### **Decentralized Model**

- The advantages of a decentralized model are the support of dynamic, organic interdisciplinary collaborations that arise naturally from the grassroots at RIT, the efficiency gained by avoiding a redundant administrative structure of a centralized framework, the ability to respond nimbly to new initiatives, and the potentially invigorating effects of new interdisciplinary experiences embedded in existing departmental and college structures.
- The potential disadvantages of a decentralized model are the unequal support (fiscal, reward structures, and administrative) for interdisciplinary projects in different academic units across campus, and potential inefficient duplication of effort.

## Centralized Model

- The advantages of a centralized model are focus and a clear, externally observable statement of support from the Institute for such activities.
- The potential disadvantages of a centralized model are the implied (and/or inferred) lack of support for the existing, emerging, and future interdisciplinary efforts outside of the centralized framework, an inefficient duplication of resources, and the establishment of academic programs outside of current faculty oversight and RIT's academic policies and procedures.
- *RIT Without Walls: A proposal to establish the University Center for Multidisciplinary Studies (UCMS)* is a well-thought out proposal for a Centralized Model. Administered by a Director and Associate Director reporting to the Provost, tenured faculty from RIT's colleges would be assigned to the UCMS for terms ranging from 1 quarter, part-time to long term. Under the proposal, tenured faculty could be assigned to the UCMS with the permission of their dean and department head, and would hold the title of "Faculty Associate" for the duration of their assignment.

## Hybrid Model

The Task Force believes that the best approach for RIT to overcome the barriers to interdisciplinary education and collaboration is a **Hybrid Model**, which provides some decentralization and some centralization. This approach presents a more cohesive perspective of the Institute's interdisciplinary efforts, and improves positioning for the Institute's future trajectory.

The hybrid model we describe capitalizes on the advantages of both other models:

- It leverages the decentralized good works already in place today and incubates new activities with lightweight overhead.
- It provides an internally and externally visible statement of RIT's intentional support for interdisciplinary activities.
- It has a central location of contact for faculty, staff, students, and external partners and friends to contact.
- It relies on RIT's established academic policies and procedures<sup>4</sup> with support for interdisciplinary activities with appropriate process and quality oversight.
- It provides the resources and organizational policies needed to overcome some of the obstacles identified in section 4.

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<sup>4</sup> Current examples of policy violations in the area of degree certification notwithstanding, the Task Force ensured that all its recommendations follow current policies.

## 6.4. Create a Collaboratory for Interdisciplinary Education and Innovation

Addressing the name and charter of this Task Force, we propose an embodiment of the hybrid model as the **Collaboratory for Interdisciplinary Education and Innovation**, led by an Associate Provost for Interdisciplinary Education and Innovation (IE&I). The Associate Provost for IE&I would have responsibility for three interacting activities housed and supported in the **Collaboratory**:

1. Center for Student Innovation
2. Educational Incubator
3. Individualized Degree Programs

In addition to the Associate Provost for IE&I, the **Collaboratory** would have affiliated faculty with prominent responsibilities in the **Collaboratory** as described below. These faculty would receive course release from their home colleges/departments for their **Collaboratory** activities funded by the **Collaboratory**. The Associate Provost for IE&I would also contribute to annual reviews of affiliated faculty. The assembly of the Affiliated faculty would be an internal advisory board for the Collaboratory working to expand on the recommendations proposed here, and to grow RIT's interdisciplinary activities in imaginative ways that go beyond everything that the Task Force considered up to this point.

### Center for Student Innovation

The **Center for Student Innovation (CSI)** serves as “Collaboration Central” for many interdisciplinary student projects on campus today, and can grow with the **Collaboratory** to include more projects including more students, faculty, and staff from across campus.

It could serve as a hub for externally funded projects involving interdisciplinary teams consisting of investigators from multiple colleges that do not have the necessary space in their home colleges. This would require the option on Proposal Routing Forms for the Associate Provost for IE&I to sign off on space allocation for such projects and the allocation of some F&A to the **Collaboratory**. The new position of Executive Director for Commercialization & Innovation could be a conduit for connections to external funding for innovation projects.

The **CSI** would continue to serve as an innovation showcase on campus and an ideal location for **Educational Incubator** pilot projects requiring dedicated space for a short period of time.

The **CSI** would have a **Collaboratory** affiliated faculty coordinator, or possibly a small committee of **Collaboratory** affiliated faculty as the coordination group, reporting to the Associate Provost for IE&I. A full-time technical support staff member, reporting to the faculty coordinator, and some administrative support would also be required.

## Educational Incubator

The **Educational Incubator** should become “Collaboration Central” for faculty who want to work together to discuss, propose, and pilot new cross-college educational initiatives. Faculty who want to propose new interdisciplinary courses, course sequences, minors, double-majors, or academic programs could make use of the connections, support, space, and experience of the **Educational Incubator**. Connections could be made through the **Collaboratory**; interested faculty could register and search for others on the **Collaboratory** website. Connections may also spring from existing, or spark new interdisciplinary research collaborations; e.g., faculty from two or more colleges already collaborating on an externally funded research project may decide to propose a new sequence of courses based on their collaboration, or faculty who initially meet to pilot a new interdisciplinary course may later form a research collaboration.

The Associate Provost for Interdisciplinary Education and Innovation would serve as the Director of the **Educational Incubator**, and participating faculty would include their efforts in their annual Plan of Work. Funding for additional course release, pilot projects, etc., not funded by the faculty’s home department would be available from internal grant opportunities (e.g., PLIG, and other recommendations for funding opportunities given in Section 6.2 of this report.) There also can be **Collaboratory** affiliated faculty in the Educational Incubator for faculty with more extensive interdisciplinary activities, or special projects funded by the Provost.

## Individualized Degree Programs

**Individualized Degree Programs** would be available through any RIT college. Coordinated by a faculty Individualized Degree Program (IDP) Coordinator reporting to the Associate Provost for Interdisciplinary Education and Innovation, IDPs would be formulated by students in consultation with faculty members from any RIT colleges affiliated with the **Individualized Degree Programs** in the **Collaboratory**. Each student’s IDP study plan must identify a ‘primary college’ in which a minimum number of upper-level credits will be earned. The IDP study plan should be developed in consultation with affiliated faculty members in the primary college and other colleges as appropriate to the plan, and be approved by the faculty IDP Coordinator. The primary college’s curriculum committee (or a subcommittee designated by that curriculum committee) must then approve the IDP study plan. Students following an IDP study plan will require continual advising which can be provided by **Collaboratory** affiliated faculty, faculty with more permanent assignments in the IDP, or professional student advising staff assigned to the IDP. Upon completion of the approved study plan, the primary college will certify the student for graduation. The assemblage of **Collaboratory** affiliated faculty would be responsible for defining and maintaining curriculum standards for IDPs.

It will also be possible for cooperating programs to create predefined IDP study plans which, while not individualized, are sufficiently interdisciplinary so as to not meet the degree requirements for any current program and must therefore be offered as an IDP. This could be done when there is notable student interest in a study plan but not enough to support a new degree program, or as a first step toward defining a new interdisciplinary degree program.

## Creating the Collaboratory

The organizational structure, depicted in Figure 6.2, can be implemented very quickly to present a more cohesive perspective of the institution's interdisciplinary efforts to better leverage the good works already in place today, overcome barriers, and improve positioning for the Institution's future trajectory.

Creating a **Collaboratory** website will provide a common virtual space for reporting successes, identifying resources, and linking interested parties. This may start with an interdisciplinary web site to highlight faculty, staff, center, student, college, and institute successes (including CMS). It would also help to identify resources already available for interdisciplinary efforts and determine if any efficiencies exist in an integrated perspective. The **Collaboratory** website would help to develop interdisciplinary communications with input from the Colleges to present a more integrated face and make it easier to see where great efforts are occurring (for internal and external audiences).

## Resources

The Associate Provost for Interdisciplinary Education and Innovation is a new position. Initially the responsibilities for this position may be assumed by another senior leader, but the Task Force's hope is that interdisciplinary activities expand to warrant this full position. An interim director currently leads the **Center for Student Innovation**; the faculty IDP coordinator and academic coordinators would likely come from the current CMS faculty, and the Associate Provost would serve as Director of the **Educational Incubator**. The Executive Director for Commercialization and Innovation position has been announced and is presumably funded.

Incremental funding would be required for course buyout for Collaboratory affiliated faculty in all RIT colleges (unless current CMS faculty take those roles), and for faculty who request buyout to participate in the **Educational Incubator**. This model also requires incremental funding for the identified administrative and technical support staff.

## 6.5. Continue the work of this Task Force

We believe the potential to expand interdisciplinary initiatives at RIT is very high. RIT can make significant progress with limited investment. There have been several previous efforts to document barriers to interdisciplinary activities at RIT, but there was no apparent progress beyond those efforts. This report and the termination of this Task Force's activities are not the end of the work. We encourage RIT's leadership to pursue the recommendations presented in this report.

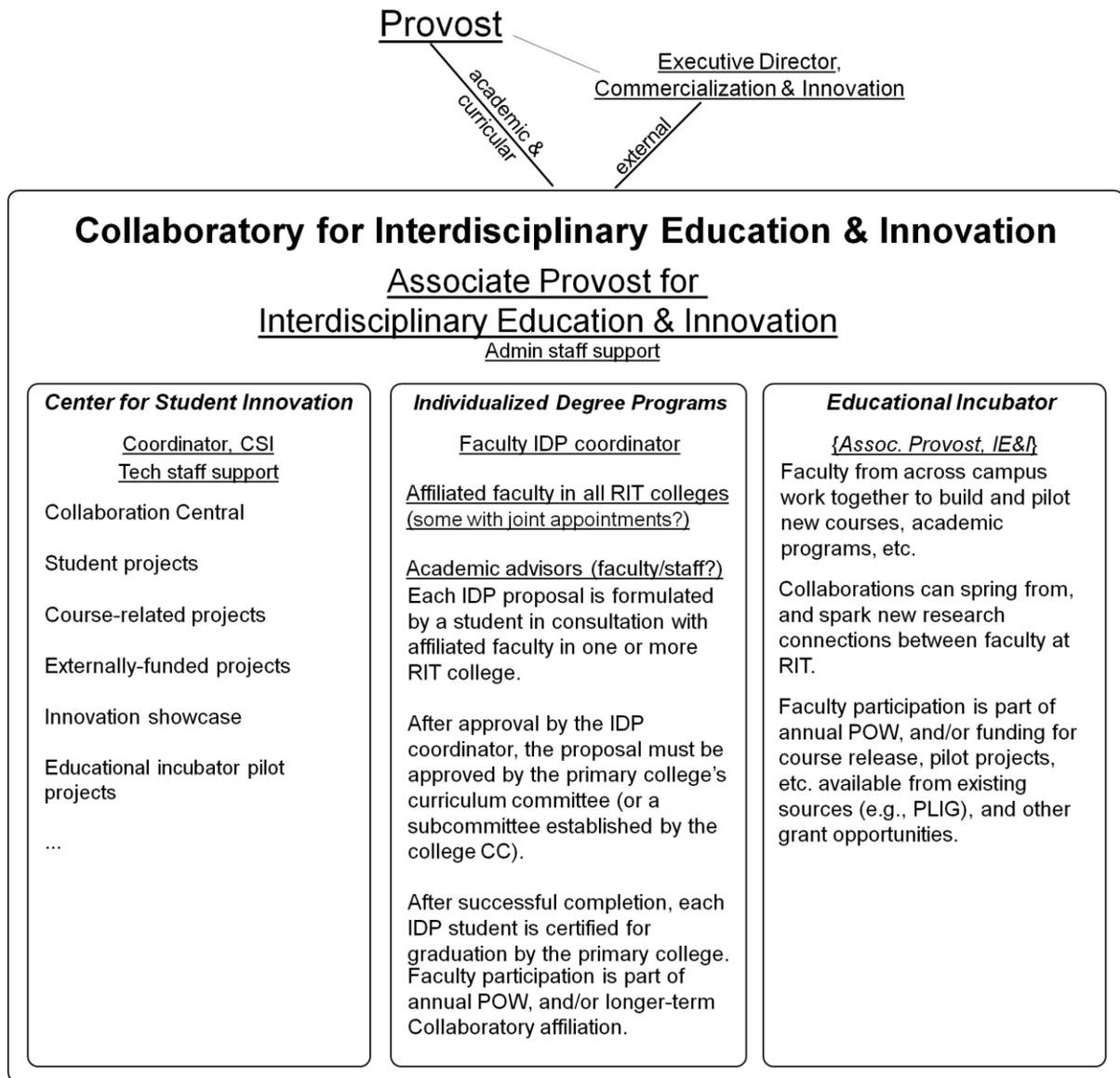


Figure 6.2. Potential structure for *Collaboratory for Interdisciplinary Education and Innovation*

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## Appendix B. Mapping of Obstacles to Recommendations

Obstacles	Think-Tank/Advisory Board	Collaboratory Website	Networking Events	Internal Funding Programs	Classroom Speaker Program	Honors Interdisciplinary Initiatives	Interdisciplinary Learning Communities	Interdisciplinary Projects	Project Opportunity Clearinghouse	Merit, Tenure, and Promotion Policy Revision	Revised Course Accounting Policy	University level funding for interdisciplinary initiatives	Funding Priority for Interdisciplinary Initiatives	Leverage new SIS to improve course numbering	Associate Provost for Interdisciplinary Education	Identify role for interdisciplinary courses in general education framework
Collaborative work is not formally recognized/rewarded in merit, tenure, and promotion policy						X				X	X					
Inconsistent mechanism for credit assignment for collaborative teaching across campus				X			X			X	X					
Difficult to cross-list and schedule courses														X	X	
No single point for decision making and authority regarding collaborative teaching issues															X	
Lack of funding for bottom-up initiatives				X								X	X		X	
Existing collaborations are poorly disseminated and hard to leverage		X	X		X				X							
Lack of college and dept resources to facilitate new collaborative efforts				X								X	X			

Recommendations	Obstacles	Identify role for interdisciplinary courses in general education framework	Associate Provost for Interdisciplinary Education	Leverage new SIS to improve course numbering	Funding Priority for Interdisciplinary Initiatives	University level funding for interdisciplinary initiatives	Revised Course Accounting Policy	Merit, Tenure, and Promotion Policy Revision	Project Opportunity Clearinghouse	Interdisciplinary Projects	Interdisciplinary Learning Communities	Honors Interdisciplinary Initiatives	Classroom Speaker Program	Internal Funding Programs	Networking Events	Collaboratory Website	Think-Tank/Advisory Board
No model for sharing resources (e.g., admin support or computing resources) across units			X				X										
Difficult to identify and coordinate with appropriate partners for collaborative work									X		X		X			X	
Concern over low demand for new initiatives	X		X					X				X					X
Roles, expectations, and accountability for collaborators are not well-defined	X		X				X	X									X
Concern over different paradigms in the classroom and in research techniques across campus	X									X	X	X	X				X
Silo mentality	X		X				X	X	X	X	X		X				X
Fear of failure								X						X			

## Appendix C. Financial Resources Needed

Recommendation # from Report	Description	Requested Amount	Timing of Need and Notes
6.1	Better recognize existing successes	\$4,000 annually for student help to maintain website	Immediate need
6.2	Foster more collaboration		
6.2.1	On-going Committee	No new funds requested	Leverages existing resources
6.2.2	Create a Think Tank for Defining Interdisciplinary Strategic Direction	\$5,000 annually	Funds to support travel and hospitality for once or twice a year meetings of the think tank
6.2.3	Create Cross College Networking Events	\$600 - seeking a Development Sponsor for the annual amount as a named event	to support 12 events at \$50 each, Administrative support - from an existing resource to schedule and invite to the event
		\$2,000/1 to 3 years out	1-3 years out - To add funds to invite external parties, occasionally throughout the year
		TBD - future years	To support physical space dedicated to interdisciplinary relationship building

<b>Recommendation # from Report</b>	<b>Description</b>	<b>Requested Amount</b>	<b>Timing of Need and Notes</b>
6.2.4	<b>Grow Support for Interdisciplinary Educational Initiatives</b>	53,234	33234 +20,000 for fellowship
6.2.5	<b>Initiate an Interdisciplinary Faculty Classroom Speaker Program</b>	Use faculty from above	
6.2.6	<b>Grow Honors Programs Interdisciplinary Initiatives</b>	No new funds requested	Leverages existing resources
6.2.7	<b>Further Leverage Interdisciplinary Learning Communities</b>	TBD	Budget for out-of-class excursions and to support LC Coordinator
6.2.8	<b>Interdisciplinary project activities across the disciplines</b>	TBD	Faculty release time to oversee projects
6.2.9	<b>Create a Project Clearing House - For Collaboration Across Disciplines</b>	\$4,000 annually	Cost of maintaining a website - 1 person
6.2.10	<b>Expand Interdisciplinary Teaching and Learning through Merit, Tenure and Promotion Criteria</b>	Time needed for evaluation	
6.2.11	<b>Review the RIT Cost Model and Other Resource Allocation Tools with Respect to Interdisciplinary Teaching and Learning</b>	TBD	Limited start-up, some incentives to encourage team teaching.
6.2.12	<b>Small Business Innovation Research Funding Model</b>	TBD	Administrative support at various levels where proposal was recommended.
6.2.13	<b>Increase priority to pursue new funding or reallocate existing funds</b>	No new funds requested	Leverages existing resources

Recommendation # from Report	Description	Requested Amount	Timing of Need and Notes
6.2.14	Leverage new Student Information System Course Numbering	No new funds requested	Leverages existing resources
6.3	Potential Organization Structures		
6.4	Collaboratory for Interdisciplinary Education and Innovation	New Associate Provost position	Initially role may be merged with other senior leader
	Center for Student Innovation	Release for <b>Collaboratory</b> affiliated faculty	
	Educational Incubator		
	Individualized Degree Programs		

# Appendix D. Duke University Interdisciplinary website

Contact Us | Provost's Office | Duke Home | Duke Research

*a signature strategic advantage*  
**Interdisciplinary Studies**  
at Duke University

Search

Education | University Institutes | School-Based Centers | Resources

### PUTTING KNOWLEDGE IN THE SERVICE OF SOCIETY

Students at the [Duke Global Health Institute's Center for Health Policy](#) developed a cookbook that will be used by a DGH-affiliated obesity intervention currently under way in North Carolina. The cookbook "Cooking Healthy, Easy Foods While Saving (CHEFS)," aims to help low-income families and people with chronic health issues to eat healthy. [more>](#)

The [Kenan Institute for Ethics](#) is piloting a multi-site community-based research and service project in eastern Nepal and Durham to explore ethical and health-related issues surrounding the resettlement of tens of thousands of Bhutanese refugees. The [Duke Global Health Institute](#) is partnering with the Kenan Institute to focus on the health needs of the refugees, particularly mental health.

[More from Kenan](#)  
[More from DGH](#)  
[More examples >](#)



*The Nicholas Institute for Environmental Policy Solutions* combines the efforts of scientists, economists, lawyers, and other experts to develop innovative, effective solutions to critical environmental problems. [Connect to NI >](#)

### NEWS AND EVENTS

November 16, 2010  
Kenan Distinguished Lecture in Ethics: Samuel Bowles  
November 29 lecture on "Machiavelli's Mistake: Why Good Laws are No Substitute for Good Citizens" will be followed by an interdisciplinary panel discussion and reception. [more >](#)

November 5, 2010  
Global Health Course Explores Cross-section of Human, Animal and Environmental Health  
An innovative new course is being offered this spring by faculty at Duke, NC State and UNC-Chapel Hill, based on the One Health approach, which offers

### SPOTLIGHT ON INTERDISCIPLINARY STUDIES:

Franklin Humanities Institute's New "Haiti Lab" First of Its Kind

The lab merges research, education, and practical applications of innovative thinking for Haiti's disaster recovery and for the expansion of Haitian studies in the U.S. and Haiti. The "[Haiti Lab](#)" is the first [humanities laboratory](#) at the [Franklin Humanities Institute](#). Located at the FHI's new headquarters at the Smith Warehouse, the Haiti Lab takes its inspiration from the collaborative and discovery-driven model of research laboratories. Undergraduate and graduate students work with specialists in Haitian culture, history, and language on projects featuring vertical integration of Duke University expertise across disciplines and schools. The Haiti Lab is also a resource for