

**New Brunswick Strategic Plan Proposal:
RU FIT: GRAD: A New Program for Innovations in Graduate Education Across the
Disciplines**

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Principal strategic priority addressed: Strong Core of Sciences and Humanities

Secondary strategic priorities: Envisioning tomorrow's university; Transforming the student experience

Cross-cutting: Who is affected by these activities: All Rutgers graduate students, regardless of program, the faculty and disciplines in which they work; the undergraduates who are taught by the graduate students.

ABSTRACT, including relevance to the primary goal of building a Strong Core of Sciences and Humanities

Graduate students provide the backbone for much of the research, scholarship, and even the teaching we do at Rutgers. A world-class research university, doing state of the art groundbreaking work in areas from sciences to humanities, and capable of attracting the best faculty and students world-wide into its programs, must remain dedicated to providing the finest graduate education possible.

Individual graduate programs cannot, by themselves, fulfill all the many and varied demands of graduate education and training. Over the past five years, the Graduate School-New Brunswick, working with funds provided by a grant from the National Science Foundation, as well as the contribution of partnering groups, programs, and faculty within Rutgers, has embarked on a series of projects and activities, available to graduate students across the disciplines, to develop, enrich and enhance the education and training of graduate students. The purpose of this Strategic Plan proposal is to make these activities a permanent part of graduate training by creating a new structure, *RU FIT: GRAD*. RU FIT:GRAD will be available to graduate students across the entire NB community. It will organize, coordinate, expand, disseminate, and support (by means of fund-raising and grant writing) activities essential to the research and education of graduate students. The activities will cover 6 core areas: Communication skills; Responsible and ethical research; Mentoring; Teaching; Career decisions; and Outreach.

These activities have the potential to attract significant external funds and contribute to the grant-seeking activity of all Rutgers projects that involve any aspects of support or training for graduate students or postdoctoral associates.

Background

The ability to provide a coordinated platform of new innovative training and educational activities for graduate education over the past 5 years (2009-present) was made possible by a grant from NSF's "I-cubed" program (Innovation for Institutional Integration) (coPI's: Kukor; Kowler). NSF's I-cubed program funds projects that seed new activities with the specific goal of fostering changes in institutional policies, practices and culture. I-cubed grants are not renewable and the I-cubed program no longer exists at NSF, however, NSF continues to closely monitor the progress and achievements of its active I-cubed projects through annual reports, evaluations and national conferences (the last one just this past March), including monitoring the success of the projects at creating structures within the universities to sustain the accomplishments.

The activities supported by the I-cubed at Rutgers focused on training graduate students in areas that either called upon expertise not typically available within graduate programs, or that could and should be carried out within interdisciplinary settings. Our I-cubed either created new activities, or expanded and developed existing activities whose worth had already been demonstrated, but needed resources to reach sufficient numbers of students. All the activities focused on elements of training that would allow graduate students to become better scientists and scholars, better mentors, and better teachers, and were delivered in the form of courses (non-credit bearing), workshops or other types of training programs.

The I-cubed developed and refined its sponsored activities with the guidance and participation of faculty and students across the university. Communications from the I-cubed to the faculty and graduate students were made via a variety of routes, including a new website (<http://gsnb.rutgers.edu/ProjectAGER>), emails, special conferences dedicated to discussions of the needs and aspirations of the programs, faculty committees and working groups, student participation in faculty boards such as the Graduate School's executive committee, and numerous surveys to elicit the comments and reactions of the graduate students. A program of I-cubed "mini-grants" was also instrumental in eliciting innovative ideas from programs and from faculty or student groups.

The I-cubed also worked to expand and supplement existing programs. For example, the I-cubed worked with the Graduate School to add training in online teaching to its teacher-training program. The I-cubed also has been working with the many NSF funded summer undergraduate research programs (the NSF REU sites), providing training for graduate students to act as mentors for the undergraduate interns and providing additional support to increase the numbers of under-represented students participating in summer research. The summer REU-site programs serve as gateways to research for undergraduates nationwide, as well as providing an important recruiting vehicle for our graduate programs.

Significance: Impact and Benefit

A Strategic Plan grant will make it possible to put in place a sustainable structure for the activities whose value was established by the I-cubed project. The sustainable structure will accomplish the following:

- Establish that Rutgers is committed to providing the best possible education and training of its graduate students, and the highest quality graduate student research.
- Provide a visible and persuasive format to attract support from granting agencies, foundations or individual donors that will contribute to sustaining and expanding the activities.
- Establish the culture and traditions that will ensure that all graduate students across Rutgers have opportunities for enhanced education and training as part of their graduate careers.
- Produce cohorts of graduates with doctoral and masters degrees who will be even better prepared to take on the challenging careers of the 21st century, and serve as ambassadors for Rutgers nationwide and worldwide.

Plan

The activities to be offered will consist of a set of courses and workshops under a single umbrella, and going under the name *RU FIT*¹: *GRAD* (Graduate Research Activities and Development). Activities will consist of *courses* and *workshops*, be coordinated, scheduled, posted, advertised and administered by the Graduate School-NB. Courses and workshops will be led by those with appropriate training and experience, including faculty, staff, or selected and qualified advanced graduate students or postdocs.

Activities of RU:FIT: GRAD will fall into the following 6 areas:

(1) *Communication*: One of the most important innovations of the I-cubed was creating and funding a course (zero-credit, taught by specialists in the Rutgers Writing Program), to teach graduate students how to write effective research manuscripts. Individual graduate programs rarely engage in specific training in writing skills, yet the needs of the students, and the expectations placed upon them, are enormous. The course met weekly and implemented a rigorous program emphasizing principles of effective writing, which students learned by working on real writing projects over the course of the semester. Continual discussion and critiques by members of the class were essential components. Funding limited enrollment to 20/semester. As a result, students were continually being turned away. We propose to expand the course to accommodate more students, add a second semester, and offer comparable courses on preparing effective talks; and communicating to a broad audience.

(2) *Responsible and ethical research*: Courses and programs on Responsible and Ethical Research (RER) are becoming part of graduate education nationwide, in part because of stringent requirements of granting agencies and in part because of importance of ensuring the public trust in research. The I-cubed has been sponsoring a course (zero-credit) in RER which, just like the writing course, quickly fills all available seats. The course covers topics ranging from avoiding

¹ RU FIT is the well-known acronym used by the Recreation Center to stand for fast, intensive training. We like the spirit of action and determination it conveys, and believe it will contribute to dissemination across the university.

research misconduct, and the ethics of publishing and peer-review, to the dilemmas and conflicts students confront routinely when trying to align their immediate and long-range goals with the realities of day-to-day life with faculty advisors, collaborators, or scientists and scholars in their fields. The discussion format has led to lively and frank exchanges, where students across the disciplines get to hear about, present and reason about realistic dilemmas in their work. The RER course needs to be offered each semester to accommodate the demand and interest.

(3) *Mentoring*: As the numbers of undergraduates participating in research (and the funding for such participation) grows, graduate students are increasingly called upon to serve as co-mentors for undergraduates. Graduate students benefit from this experience by expanding their research portfolios, and gaining important skills in mentoring that contribute to their preparation for faculty or supervisory research positions. The I-cubed has sponsored programs and activities to train graduate students in mentoring, so that the graduate students, and the undergraduates, gain the most benefit from the experience. Rutgers is in an excellent position to develop and disseminate such programs because of the large cohort of summer undergraduate interns who attend the several NSF sponsored REU site programs, as well as the well established Rutgers RISE program (Research in Science and Engineering). In addition to providing workshops for mentoring training, the I-cubed is collaborating with four REU site projects this summer in a new project to monitor the progress and experiences of the graduate student mentors. Training for graduate students to serve as mentors should be an option for all graduate students at Rutgers.

(4) *Teaching*: The Graduate School has a well-established program of training graduate students to become better teachers. The I-cubed added to that program by sponsoring a new course for training in online teaching. Graduate students are involved in teaching at Rutgers, either as instructors for discussion or lab sections, or as teachers of courses during the summer or during the academic year. It is in everyone's interest, the undergraduates, the departments, the graduate students, and the university's as a whole, for the graduate students to become effective teachers. Some graduate programs include such training and some do not. We propose to incorporate training in teaching as part of our RU FIT: GRAD program, preserving the most effective aspects of the current training courses, and expanding as needed to respond to evolving needs.

(5) *Career decisions*: The I-cubed created and offered many workshops in essential elements of preparation for careers, including discussions of how to identify and discover new career opportunities in the universities, colleges, community colleges, industry and government. Forums in which Rutgers doctoral alumni are invited have been particularly valuable for the students. Included in these activities are workshops for students interested in entrepreneurship and inventions. We propose to continue and expand the topics covered by these workshops.

(6) *Outreach*: Graduate students are involved in an impressive degree of voluntary outreach activities, in particular efforts at the K-12 level or projects dealing with environmental issues. We do not need to do much to get graduate students out in the community other than to provide a central structure to disseminate opportunities, and allow graduate students to share information and experiences.

Measures of success

Stringent assessments and evaluations will be performed continuously. These will consist of (1) detailed records of the participants in all activities, including numbers of participants and program affiliation; (2) exit surveys to elicit comments and recommendations; (3) voluntary follow-up to determine the impact of the activities on future work and careers; (4) meetings with graduate program faculty to determine and track developing needs for graduate training so that the activities will evolve to meet changing demands; (5) publications and talks resulting from these activities; (6) new grants and other resources attracted due to these activities; (7) annual reports to the Graduate School and any other Rutgers office of the same rigor as annual reports of grant progress made to NSF or NIH.

Resources required to initiate the project and provide the basis for future fund-raising

We request funding for a post-doctoral position (3 year appointment) to act as the RU FIT: GRAD director. We seek an individual whose doctoral training is or related to higher education, who has aspirations to create and promote novel and effective new programs. The individual we seek would be someone with a record of interest in program creation and in research related to education or the science of learning, who would view this position as an important part of their professional and research careers. As is the case with research postdocs, the position would rotate to a different individual every 3 years in order to ensure that the project continues to evolve to meet changing needs and be open to new and innovative ideas. The director would report to the Graduate School Dean and have two major roles:

The first is the creation and coordination of the activities offered in any given semester, including recruiting activity leaders, setting activity agendas, monitoring and assessing progress, and dissemination within the university.

The second major role is research, grants, and fund-raising. *RU FIT: GRAD has enormous potential to contribute to fund-raising and grants.* The director would be charged with working across the Rutgers community in writing grants to agencies and foundations to fund and expand the activities, as well as preparing submissions to conferences and journals for wide dissemination. The director will also work with faculty groups preparing training, project, or research proposals which involve support for graduate students, postdocs or undergraduate research. Such proposals, particularly those directed to large federal agencies, require an infrastructure and a set of plans for education and mentoring. The activities of RU FIT: GRAD not only provide a set of activities to meet these needs, but also provide a platform for proposals to build on and expand these activities in productive and important directions.

Resources requested

Salary and benefits for the postdoctoral director: \$65,000/year

Hourly clerical assistance and hourly assistance for web site development \$5000/year

Supplies, including posters, software, small PC \$3000/year

Leveraged resources include: GSNB staff; Faculty/students/postdocs who conduct courses and workshops; NSF supported REU-site projects (collaborators on mentoring training); present and future grants, including new training or other grants to build the proposed activities; contributions of graduate programs to courses where specific expertise of the instructor is required (e.g., the writing course).