

New Brunswick Strategic Planning Proposal

Proposal Title: RU-TTEC – Rutgers University Teaching Technology Enhancement Center

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Primary Strategic Priority/Foundational Element/Integrating Theme Addressed (Select one)

- Envision Tomorrow's University
- Build Faculty Excellence
- Transform the Student Experience**
- Enhance Our Public Prominence
- Strong Core of Sciences and Humanities
- Inclusive, Diverse, and Cohesive Culture
- Effective and Efficient Infrastructure and Staff
- Financial Resources Sufficient to Fund Our Aspirations
- Robust Shared Governance, Academic Freedom, and Effective Communication
- Cultures, Diversity, and Inequality—Local and Global
- Improving the Health and Wellness of Individuals and Populations
- Creating a Sustainable World through Innovation, Engineering, and Technology
- Educating Involved Citizens and Effective Leaders for a Dynamic World
- Creative Expression and the Human Experience

Proposal Abstract (brief summary of the proposal – 250-word limit):

We propose a Rutgers University Teaching Technology Enhancement Center (RU-TTEC), a service organization dedicated to the design, development, and deployment of innovative teaching technology solutions. RU-TTEC will be cross-cutting, provide educational tools and infrastructure that will transform the student experience, and position the University as an international leader in advancing the state of the art in higher education. RU-TTEC's role will be to intelligently deploy technology that leverages the power inherent in high enrollments to create self-directed learning communities and improve student outcomes without increasing instructional load.

Vision

We envision tomorrow's Rutgers to be one that transforms the student experience into one whereby classroom and online instruction are seamlessly integrated, students are immersed in a learning environment where social and academic boundaries are blurred, and a culture of scholarly excellence is cultivated.

Mission

The mission of the RU-TTEC is to create innovative educational technology and infrastructure that is aligned with the tactical institutional plan to enhance the learning environment at Rutgers. The overarching goal is to create a vibrant, close-knit community of scholars that work together—both in the classroom and in the virtual space—to achieve student learning goals. Primary to the mission will be the design of a campus-wide social academic network that provides a customized learning experience for individual students, and enables instructors to optimize the impact of face-to-face time with students in either a regular or online flipped classroom setting.

Full Proposal Description (5-page limit)

[Insert here the full proposal, which should describe in detail a) what is being proposed, b) how the initiative aligns with the University Strategic Plan, c) any additional themes, priorities, and elements addressed, d) who will be involved, e) desired outcomes, and f) anticipated resources to support this initiative.]

A) What We Propose

We propose the creation of the Rutgers University Teaching Technology Enhancement Center (RU-TTEC) that has the mission of delivering innovative educational technology solutions to meet the challenges facing higher education at Rutgers and nationally. The RU-TTEC will be cross-cutting, provide key enabling technology and infrastructure that will raise the quality and excellence of Rutgers for our students, and establish the University's preeminence in teaching.

RU-TTEC will...

- Be concentrated, lightweight, and agile with a delayed organizational structure
- Build upon a successful entrepreneurial team with a strong track record of innovation in online educational technology
- Collaborate with faculty, departments, institutes, centers and schools on targeted high-impact projects that:
 - 1). Enhance the student learning experience at Rutgers
 - 2). Bolster the reputation of Rutgers as a leader in higher education
 - 3). Demonstrate potential for commercialization

Our vision of Rutgers is as a University where classroom and online instruction are seamlessly integrated and mutually enhanced, allowing students to be connected with each other and with their instructors through a campus-wide social academic network. In this way Rutgers will leverage high enrollments and existing social networking infrastructure to promote a culture of academic excellence.

Background

Student life in college is dominated by two driving forces: academic pursuits and social interactions. Social interactions, in turn, are dominated by social networks: over 98 percent of students on our campus are actively engaged with FaceBook, Twitter, Google+, etc., allowing them to connect with one another synchronously over distance and across traditional social barriers. These connections ultimately enhance the campus experience for students who use social media as their primary mode of communication and access to information.

However, there is a huge disparity between the network technology and infrastructure available to enhance social interaction as opposed to academic pursuits. This extremely powerful mechanism of networking is not being used nearly to its full potential in a scholastic context; i.e., as an enabling technology for students to effectively engage each other in an online academic community to enhance learning.

Imagine a Rutgers learning ecosystem where the lines between social and academic interactions were seamless...

- Nathan is at the campus center posting a video on FaceBook from his iPad when receives a personal message alerting him that a virtual study group in general physics has just formed and is starting to work on a "Photoelectric Effect" problem for an exam the next week. The

eLearning system used in his class has notified Nathan that this is an area where he is struggling, so Nathan joins the group and learns from his peers how to solve the problem.

- Emily returns to her dorm at 10 pm, and still has several hours of studying to do. She logs onto her laptop and, while working through her calculus homework, gets stuck on a particularly thorny problem. So, she messages her mathematics network. Nishad, a student in a different calculus section who is working from the library, receives a message that a classmate has a question he might be able to help answer. He joins Emily in a virtual study room where they work through the problem together on a virtual whiteboard. Not only does Emily finish her homework, but Nishad feels empowered by his mastery of the topic, and has found he has learned even more by helping Emily.
- After swimming practice, Myriam returns home in time to enter a virtual chemistry recitation with her favorite instructor, and is given a POGIL (Process Oriented Guided Inquiry Learning) activity with four other students. The activity is to experiment using an interactive PHET simulation of phase transitions involving different states of matter. Myriam's role is to manage the group in the interactive virtual experiment to create a mathematical model that relates the vapor pressure to temperature, and to explain the molecular basis of the observed behavior. The recitation facilitator periodically checks in online to monitor the progress of the group and to offer helpful advice.

The technology required to do bring this vision into reality is not only within our reach, it is already in development at Rutgers. Elements of the technology infrastructure needed to connect students in an online web of learning support and resources are currently being deployed in support of General Chemistry classes, including Chem 161 (1835 students), Chem 162 (1500 students) as well as Preparation for General Chemistry (Coursera MOOC – 3000+ students). The core development team exists, and the key enabling technology has been demonstrated. What is required to position Rutgers at the cutting edge of this revolution is the creation of a center specifically focused on the development and campus-wide deployment of enhanced teaching technology with network integration, and the rigorous assessment of the effectiveness of these tools.

Administration

Under the current organization of academic units, RU-TTEC could easily operate under the aegis of the SAS Executive Dean and collaborate with schools throughout the University. Given that enrollment pressure on gateway STEM courses remains at record levels, RU-TECC will forge strong ties with School of Engineering, SEBS, the School of Health Related Professions, and Rutgers Biomedical and Health Sciences. However, we understand that there is ongoing effort to consider restructuring of academic units, and it might be premature to predict how the proposed RU-TTEC would best fit into the new administration. Nonetheless, it should be emphasized that currently there does not exist any entity at Rutgers that fulfills the role of the proposed RU-TTEC.

B) How the initiative aligns with the University Strategic Plan

This proposal is about a vision to *transform the student experience* on campus as we move into the new millennium. The mechanism to achieve this will be through innovations in teaching technology created through RU-TTEC that will be deployed University-wide. Tomorrow's Rutgers will see the cultivation of a community of scholars that creates a novel 21st century learning ecosystem. These innovations will take great steps toward our goal of having Rutgers broadly recognized as among the nation's leading public universities, preeminent in research, excellent in teaching and committed to the community.

C) Any additional themes, priorities, and elements addressed

The creation of an integrated online campus community that provides social rewards for academic prowess and fosters a culture of scholarly achievement will be an integral part of how we *envision tomorrow's university*.

These tools will provide a key enabling technology and infrastructure that will help to *build faculty excellence* as educators. The success of the mission will enhance our public prominence by demonstrating our commitment to excellence in teaching, as well as progressive thinkers and pioneers in arena of higher education.

The substantive data acquired through adaptive learning technologies will enable the University to develop teaching techniques that allow us to *measure progress and define success*.

The RU-TTEC will help close the gap with the nation's top public universities in the areas of academic programs (particularly large ranked STEM disciplines), faculty excellence and particularly student satisfaction and performance, and infrastructure.

D) Who Will Be Involved

The core team consists of Darrin York, Francesca Guerra, James Chun, Raship Shah and Swapnil Patel. This is a unique group in that all come from different disciplines, yet share the same vision of the critical role of technology in enhancing education. We are a fast, focused, efficient and effective development team. We believe that all the new and exciting changes to education can and should be developed specifically to meet the needs of 21st century learners and teachers. As a project supported by the University Strategic Plan, we would bring on board a select number of key figures to aid in technology development, fill disciplinary gaps, and expand our scope and capacity. However, the goal is to remain responsive, fast-paced, and nimble.

Partners

Internal:

- *Learning Resource Centers*: Collaboration on development of peer-learning environments.
- *Office of Technology Commercialization (OTC)*: Product commercialization/monetization.
- *Office of Instructional and Research Technology (OIRT)*: Systems and hardware support; instructional design consulting.
- *Laboratory for Computer Science Research*: Data-mining and exploitation.
- *Center for Online & Hybrid Learning and Instructional Technologies (COHLIT)*: Instructional design consulting; technology development.
- *Graduate School of Education*: Pedagogical and curriculum consulting.

External:

- Pearson Education: Market research/project assessment.

E) Desired Outcomes

The desired outcomes for RU-TECC are:

- Substantial, enduring, and measurable enhancement of the student experience through the integration of academic pursuits into a social academic learning network
- Harnessing our size, diversity, and geographic dispersion to create self-directed learning communities that improve student outcomes and repersonalize the learning experience
- Establishing Rutgers as a thought leader in redefining academic excellence for the 21st century
- Efficient and effective technology-enhanced teaching methodologies
- Revenue generation through licensing and direct support with external partners (including research grants, technology integration, first to market)

F) Anticipated Resources to Support this Initiative

Support for RU-TTEC will be derived from the following sources:

- *Central Administration*: Implementation seed funding
- *Participating schools/departments*: Targeted project funding/tuition return
- *Commercialization*: Partnerships, licensing fees and other monetization strategies (including MOOCs)
- *Grants*: Federal, state, and private sector research grants
- *Endowments/Donations*: Alumni, prominent donors

The goal is for the center to be self-sustaining in the next few years. To that end, we've already started to generate support outside of Rutgers in a continuing effort to achieve that goal. Currently we are using the "Online Tuition Return" model through the SAS to help fund our current team to build infrastructure that provides the foundation to carry us forward in our mission. This model will likely be phased out soon, and we have been actively seeking other avenues of support outside the university.

Both Pearson and Cengage publishing are currently working with our team and with the Office of Technology Commercialization (OTC) in an effort to formalize their support with a 2-3 year research grant (Pearson) and licensing arrangement for our patented technology (Cengage). The innovations developed by our team will help to establish Rutgers at the forefront of online education. This, in turn, will enhance our marketability with publishing companies that are eager to be first to market as corporate partners. Together, these mechanisms of commercialization may provide a substantial revenue stream to sustain the RU-TTEC and allow for aggressive financial growth.

We have also taken the initiative to pursue a MOOC this summer with Coursera, and are working with the Coursera technical team on a partnership where our interactive web tools are used to enhance the online learning experience. This may ultimately lead to revenue either directly through licensing, or indirectly through target marketing.

Finally, the RU-TTEC will serve as a center that provides infrastructure and support to facilitate external funding. We have already secured an NSF TUES grant for 200K for this project, and other grants, including from the Gates Foundation and NSF SBIR are strong candidates for funding.

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Proposed Measures to Mark Progress or Determine Success

[Please explain, in one or two paragraphs, how progress toward achievement of the initiative will be measured and how overall success will be determined.]

RU-TTEC will be a success when:

- No Rutgers student is turned away from a STEM course due to lack of space.
- Student performance is measurably improved in key gateway courses.
- A burgeoning social academic network takes hold at Rutgers and leads to a greater sense of cohesion and common purpose among the student population.
- Teaching technologies that are developed for STEM disciplines are deployed in courses throughout the University and across disciplinary lines.
- Licensing and grant revenue generated by RU-TTEC is reinvested back in technology development and other University strategic priorities.

Please save your proposal as a Word document and submit it as an email attachment to NBStratPlanProposals@rutgers.edu by April 15, 2014.