General Faculty Meeting
April 6, 2015

Meeting opens: 2:07pm
Welcome by Professor Jose Holguin-Veras, President of the Senate.

Professor Holguin-Veras opened the meeting by welcoming the faculty.

Agenda:
1) Welcome and Review of the Faculty Senate Accomplishments, Questions and Answers, Jose Holguin-Veras.
General Faculty Meeting
April 6th, 2015

José Holguín-Verás,
Chair of the Rensselaer Faculty
Agenda

❖ Welcome

❖ Review of the Faculty Senate Accomplishments, José Holguín-Veras, Chair of the Faculty (10 min)

❖ State of the Academic Enterprise, Prabhat Hajela, Provost (30 min)

❖ Honoring Faculty: Retirees and Faculty Senate, José Holguín-Veras (10 min)

❖ Eulogies, Lester Gerhardt, President of Faculty Senate (5 min)

❖ Faculty Comments (30 min max)

❖ Reception
Review of the Faculty Senate Accomplishments

José Holguín-Veras,
Chair of the Rensselaer Faculty
Continuing process of engagement

❖ Provost, Associate Provost and Dean of Graduate Education, Academic Deans, Department Heads, Chief Financial Officer, Chief Information Officer, VP Human Resources, and Legal Counsel

❖ Bilateral meetings with Student Senate

❖ Participation in Middle States Accreditation process
Multi-year effort:

- Two faculty committees produced: a first draft of changes, and a second set of revisions
- Leading faculty members from all schools were asked to provide input
- The female faculty, through RAMP-UP, provided input
- The EC visited all schools to gather direct input from faculty
- An anonymous email account was set to gather input
- The EC collated suggestions, filtered inappropriate ones out
- The EC and the Provost went through all suggestions to find a common position
- The agreed draft was sent to Human Resources and the Legal department for review and comment
Faculty Development and Retention

- Faculty Development Forums organized jointly by the Provost and Faculty Senate:
  - RPI research initiatives and obtaining research grants, roles and responsibilities of the RPI Research Administration
  - Promotion and Tenure
  - Tools for blended learning
- The Faculty Senate and Human Resources sponsored a forum for Communication and Conflict Management
- The Faculty Senate has requested and received faculty input about faculty development and retention forums. A survey will be sent shortly to the faculty to prioritize the subjects to be discussed in the forums.
Graduate Education

- Ad Hoc Committee of the FS formed, producing a report, leading to discussions on Grad student support, recruitment (more Faculty involvement), diversity, placement, and alumni/ae relations.
- FS approved a process to evaluate TAs, expected to be implemented in spring 2015.
- A new Advising Forum, proposed by the FS, with OGE and ALAC, for both new/existing faculty, was piloted in Summer '14 and offered for the first time on March '15. To be offered each semester in the future.
Communications

- The faculty-all list was established and supported, and is in active use.
- With the assistance and support of the VP and Chief Information Officer, retired faculty now may now retain their existing email address upon retirement.
Standing Committee Highlights

- Promotion and Tenure: Numerous cases considered and timely processed.
- Curriculum: Over 150 course additions and deletions were evaluated and approved. Reviewed the Special Core Curriculum Review Committee. Changes made to the minimum GPA for inclusion in Dean’s List.
- Honors: The Committee submitted nominations for Honorary Degrees, several subsequently selected.
- Planning and Resources: Meetings with the Provost to discuss go forward strategies. Emphasis on involvement of the FS in performance planning.
Policy on Eulogies and Biographies

- The Faculty Senate established an annual eulogy publication, both electronic and hard copy.
- A policy was also established for regularly gathering source information for faculty retiring or otherwise leaving Rensselaer for future use.
State of the Academic Enterprise

Prabhat Hajela,
Provost
Honoring Faculty: Retirees and Faculty Senate

José Holguín-Veras,
Chair of the Rensselaer Faculty
### Retiring Faculty Senate Members (2013-2015)

- **Executive Committee**
  - Isom Herron
  - Chip Kilduff
  - Lester Gerhardt
  - Jose Holguin-Veras
  - Matthew Oehlschlaeger
  - Atsushi Akera
  - Pawel Keblinski
  - Lois Peters
  - Vincent Meunier

- **Faculty Senate**
  - George Belfort
  - Michael Century
  - David Bell
  - Tom Triscari
  - Jeanne Keefe
  - Antoinette Maniatty
  - Ekaterina Haskins
  - Paul Hohenberg
  - Chang Ryu
  - Igor Vamos
  - Frank Wright
  - Robert Albright
  - Robert Parsons
  - Chulsung Bae
  - Murali Chari
  - Michael Halloran

- **Curriculum Committee**
  - Wayne Bequette
  - Shawn Lawson
  - Susan Sanderson
  - Chris Verwys
  - George Plopper
  - Chris Perry
  - Anthony Titus

- **Promotion and Tenure Committee**
  - Mark Shephard
  - Christian Wetzel
  - Anna Dyson
  - Joe Chow
  - David Isaacson
  - Ned Woodhouse
  - Thierry Blanchet

- **Planning and Resources Committee**
  - David Duquette
  - Michael Oatman
  - John Gowdy
  - Chris McDermott

- **Honors Committee**
  - Joyce McLaughlin
  - Langdon Winner
  - Russ Leslie
  - Steven Cramer
  - Bill Francis
Eulogies

Lester Gerhardt,
President of the Faculty Senate
Our Departed Colleagues

- **Architecture:**
  - Roland L. Hummel

- **Arts:**
  - Robert F. Winne '49

- **Biology:**
  - Louis J. Castiglione Jr.

- **Civil and Env. Eng.:**
  - Robert K. Palmer '37

- **Chemistry:**
  - Sydney Ross

- **ECSE:**
  - Edward J. Smith '66, Ph.D.
  - Harry E. Stephanou

- **History:**
  - William H. Pease

- **Mathematics:**
  - Bernard A. Fleishman
  - Horace Komm

- **Material Science & Eng.:**
  - George S. Ansell '54

- **MANE:**
  - Edward A. Fox

- **Physics:**
  - Robert Resnick

- **Political Science/Psychology:**
  - Kenneth J. Comfort, Ph.D.

- **Psychology:**
  - Gillray L. Kandel

- **MBA Hartford:**
  - Robert C. Klein
Faculty Comments
Reception
2) State of the Academic Enterprise, Questions and Answers, Provost Prabhat Hajela.
2) State of the Academic Enterprise, Questions and Answers, Provost Prabhat Hajela.
Changing Landscape of Higher Education
The Rise of the New Polytechnic

Prabhat Hajela, Provost
April 2015
The Landscape of Higher Education

- Segmentation
- Core Education
- The Professoriate
- Affordability
- Globalization
- Government/Regulations
- Non-Traditional Students
- Demographics
Segmentation

"the higher education market now resembles the American restaurant market..." - from gourmet 5-star restaurants - J.V. Koch in The Rise of the Knowledge Economy

Rise of the
- From traditional two-year colleges to 4-year BAs and graduate programs
- Move into online education (Microsoft, Fox PARC)

Other Entrants
- McDonald’s Hamburger U – bypass traditional education
- Museums, science centers, galleries - leveraging talent in the educational space
- 2015 - New York Times announces plans for online courses
The Professoriate

Tenure – a vanishing system

- Between 1975 and 2011, T&TT professors declined from 57% to 30% of all faculty
  - Limiting analysis to institutions with formal tenure systems – 56.2% in 1993-94 to 48.7% in 2009-10
  - For doctoral institutions – 51.1% to 42.7%
- Institutions with tenure systems declined from 62.6% in 93-94 to 45.3% in 2011-12

Opponents
- High pace of change in higher education
- Tenure suppresses institutional agility
- Tenure an economic anachronism
Globalization

The US domination of the global education market is eroding

- From Australia to EU, governments view universities as engines of economic growth – vital to compete in a knowledge economy
- Countries like China (from 1999-2009, more than doubled), Saudi Arabia, Singapore building top institutions and luring international talent
  - Overseas campuses
  - Brain Exchange vs. Brain Drain
  - Student mobility is at a high
  - GLOBAL COMPETITION is a reality
Affordability

Intense focus and publicity on the “costs” of education – decreased accessibility and burdensome student debts

Federal government data
- Over the past three decades, average tuition at a 4-year public college has increased 250%.
- Average borrower leaves college with an average debt of $30,000 – too many students leave college without a degree.

The whole truth
- Average costs are indeed rising but
  - 1/3rd of college students leave with no debt (1/2 at leading research universities).
  - Median debt is $13,000 (average $26,000).

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Affordability

- Family incomes have been stagnant over past decade, fastest increases in tuition have been in the public sector.
- Share of state university expenses from States averages 28% - a 40% decline resulting in tuition increases.
- State-supported -> State-assisted -> State-located overall student debt has included the for-profit sector consumes 25% of federal financial aid.
- On average, spend 17.1% of funds on instruction, 22% on marketing, and 19.4% on pre-tax profits.
- 96% of students take loans with 47% default rates.
- College grads still do better on the job market.
- One study suggests a 15.2% annual return on college expense.
Affordability

Moody’s Outlook comments:
- Negative for entire education sector – two positive
- “...average debt per student graduating with bachelor’s degree is still manageable, despite the dramatic rise in debt burden over time.”
- Overall, postsecondary education remains a valuable long-term investment. Families remain willing to pay for college, but their capacity to pay higher prices has largely tapped.”
Government Regulations

Exogenous Factors – Governmental Regulations

American campuses:
- Must comply with all laws applicable to any employer (ADA, I-9, HIPAA, nondiscrimination regulations, affirmative action)
- Regulated by environmental rules as much as most American industries
- Regulated as “Internet Service Providers” (Digital Millennium Copyright Act) and by copyright rules in their libraries, publishing and course materials
- Research regulations - human subject research, animal regulations, foreign export rules, classified research, federal contracts and patent law
- Regulated as financial institutions under Gramm-Leach-Bliley, and the Antiterrorist Financing rules
- Regulated for tax purposes, including charitable giving
- And also regulated in ways that are unique to education in general (and in some cases only college campuses)
  - Immigration regulations for students and scholars
  - Comprehensive financial aid and student data reporting rules under IPEDs
  - Campus safety under the Campus Security Act, Drug Free Schools acts and other law
  - Student records under the Family Educational Rights and Privacy Act (FERPA);
  - Title IX, Sexual Assault Victim Bill of Rights; and the Equity in Athletics Act.
Impact of Technology

Mark Twain’s described the college “as a place where the professor’s lecture notes go straight to the students’ lecture notes, without passing through the brain of either.”

Eliminate passivity in lecturing modes – face-to-face or online
- The need for greater student-faculty engagement
- Flipped classroom

Advertised as a highly disruptive upheaval in higher education – MOOCs

- Today, the hype is more contained and in many instances GONE
- Has had beneficial impact, particularly in highlighting the role of technology in pedagogical innovation
Impact of Technology

Beyond Online Education – technology has impacted higher education

- Learning management systems
- Documentation, tracking and reporting
- Assessment of student learning outcomes
- Data analytics – track student performance and patterns to provide personalized advising
- Adaptive learning systems and interactive teaching devices
Demographics

The changing distribution of racial and ethnic groups in the college bound population will present new opportunities and challenges for educational institutions...
Demographics

Figure 3.14. Cumulative Percent Change in Public High School Graduates in the Northeast Relative to 2004-05 by Race/Ethnicity

Note: Nonpublic school graduates are excluded.
Demographics

- Significant mismatch between the financial means of the growing demographic market and the price point of a traditional college education
- College readiness and preparation – the academic achievement gap
- Institutions not necessarily programmed to educate diverse cohorts of students
  - Recruit, support, retain and graduate
  - Institutional culture of inclusivity
  - Financial aid
  - ...

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Embodied in the Rensselaer Plan 2024

The New Polytechnic

- Offer a complete student experience
- Lead in pedagogical innovation,
- Introduce new learning paradigms
- Extend our impact on humanity through forward-looking research initiatives
A Full Circle?

- Invisible College
  - Organization of scientific knowledge in the 17\textsuperscript{th} century
  - Precursor to the Royal Society
  - Pre-eminent scientists in UK scattered but in communication with each other about their work
  - Fading with the appearance of universities
- Digitally connected world
  - Reemergence of older pattern
  - Consequences for the new universities
Old Within the New

- Challenge to the post WW II Big Science paradigm
  - Self-organizing and emergent networks
    - Agile
    - Non-hierarchical structure
    - International in scope
    - Not under funding or control of a single national organization
“The New Polytechnic”: a new paradigm for teaching, learning, and research—a view of the technological research university as a fresh collaborative endeavor across disciplines, sectors, and global regions. Such a university leads by using advanced technologies to unite a multiplicity of disciplines and perspectives, in order to take on large, multi-faceted challenges.
A Message Map – Office of the Provost

Build a Community of World Class Educators and Scholars

The RP 2024 will require a strong and committed research and scholarship-oriented faculty that will engage students and researchers in finding solutions to pressing global needs, and to prepare the next generation of global leaders.

- Align faculty recruitment to Institute strategic initiatives in research
- Identify short, intermediate, and long-term needs for faculty in each school
- Develop funding plans that support the required growth trajectory for faculty positions, especially by leveraging IWH activities
- Carefully assess and plan for laboratory and office needs to accommodate the planned growth
- Create a plan for increasing endowed Chair positions, including Constellations, to 35% of total faculty positions including the required resources
- Institutionalize the review of endowed chairs and Constellations

The New Polytechnic

Rensselaer is transformative through collaborative teaching, learning, and research across disciplines, sectors, and global regions, using advanced technologies to tackle these problems. The RP 2024 Plan will enable this vision through pedagogical innovation, globally aligned research, and transformative education.

To advance the New Polytechnic, the Provost Office will recruit a polyglot of world-class faculty – faculty who will share new curricular and co-curricular activities that embrace an interdisciplinary, perspective, creative options in technology, and global leadership, and bring new initiatives aimed at addressing the most important global challenges.

Create Vibrant Academic Offerings and Transformational Student Experiences

The breadth of educational offerings will build upon the traditional disciplines while imparting a critical/interdisciplinary perspective. Teaching, advising, and mentorship will all focus on total student development, and will take on a more collaborative character and approach.

- Implement revised BS in Building Science and support development of affiliated co-terminal opportunities
- Complete the plan for the BS in Music and new concentration in Media Engineering
- Deploy pilot Art Across the Curriculum programs
- Plan and implement Faculty Fellows program
- Expand interdisciplinary and inter-school international opportunities including planning for summer overseas semester – as part of CLASS, partner with Student Life in the new initiatives

Position Rensselaer as an Indicated Leader in Pedagogical Innovation

Technology-enabled education is central to the New Polytechnic, and new tools and technologies present remarkable opportunities for the Institute to once again assert dominance in pedagogical innovation.

- Expand the use of immersive learning environments and Augmented Reality
- Expand the use of games-based pedagogy – pursue proof points in geotechnical engineering applications and the Mandarin Project
- Deploy platform(s) for delivering blended learning in residential settings – support deployment in 2-3 pilot courses
- Create faculty development programs to facilitate adoption of new technology
- Develop assessment protocols for new pedagogical paradigms
Areas of Emphasis

- Educational Programs
  - Review of core curriculum
  - New majors/concentrations
  - ART_X@Rensselaer, data literacy, ethics,…
  - Games/immersive learning environments
  - Technology in education – online, blended,…
- Faculty Recruitment and Development
- Research Thrusts
- Student Experience
  - CLASS
  - Flexible academic calendar
- Building Diversity
Core Curriculum for the New Polytechnic

Educated Persons

- Critical and Creative Thinkers
- Exceptional Communicators
- Philomaths
- Global, Multicultural, Self-Aware Leaders

The Rensselaer Distinction

- Disciplinary Experts
- Interdisciplinary Collaborators

- Leaders who are inventive and enterprising problem solvers engaged in addressing global challenges
- Public Spirited, professionally, ethically and environmentally responsible individuals
- Rooted in a Scientific and Technological Perspective
DATUM - Data Analytics Through Undergraduate Mathematics

Learning Outcomes

- Data - problem formulation and solution
- Quantitative algorithms/techniques
- High-dimensionality data
- Exploit data repositories/resources for problem solving
- Data stewardship and documentation
- Communicate results and insights from data analysis
Why is it important for our students?

- It is about creative crossover - to reveal underlying ideas and patterns of thought that are common across disciplines.

ART_X@Rensselaer is about a unique nexus of art and science.

- Core Curriculum
- Co-curricular activities, research, hands-on projects
- Electives, infusion in broad swath of coursework
- Embedded in CLASS, Union Clubs, EMPAC programming
Multiplayer Mixed Reality Environments

Mobile Gaming - Geo Explorer

- Mixed reality and immersive environments in engineering education
- Integrate virtual practical experience into learning
- Include risks in engineering design and decision making
- Utilizing a technology that is familiar to today's students (Mobile devices, Games, Virtual reality, etc.)
Augmented Reality (AR) application designed to deliver a dynamic and interactive rendition of the 1964-65 Worlds Fair based on archival imagery, video, oral histories, and 3-D models of fair buildings.
Online and Blended Learning

Distance Learning – learning dissociated from time and/or distance
Online Learning – requires accessing online content
E-Learning – appropriate use of technology to enhance learning
Blended Learning – mix of E-Learning with F-to-F learning
Mobile Learning – use of mobile devices

MOOCs
Online Learning
Blended Learning

Content Delivery platform assumes importance
Content Delivery Platforms

**Open edX**
- Open source software that serves as a platform for online and blended learning.
- On-campus and distance learners.

**Canvas**
- Unsupervised LMS being explored by faculty on an experimental basis.

**Grapefruit**
- Rensselaer RCOS student-developed system for online and blended learning.
- Used in Virtual Calculus Bridge in 2014.

**Blackboard**
- Official LMS at Rensselaer.
- Central Hub where faculty post content, organize resources, and facilitate discussions.
- Over 700 courses/sections each semester.

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The Virtual Calculus Bridge

Introductory online course in Calculus – SPOC
- Personal online support
  • First offered in Summer 2014
  • Recruitment/retention of underrepresented groups

Plans to develop a Virtual Physics Bridge

Online Physics
- Online lectures, tools, and notes
- Online problem solving sessions
- Online collaborative groups
- Videos, simulations, animations
- Virtual laboratory experiences
Blended Learning - Working Professionals

Rensselaer @ Hartford | Office of Advanced Professional Studies

Pratt & Whitney Certificate Program (summer 2014)
- Turbomachinery
- Fracture Mechanics
- Vibrations
- Stress Analysis
- Heat Transfer

- MS - Systems Engineering and Technology Management
  Pratt and Whitney, Maine
  summer 2015-spring 2017
- Request for Certificate in High Temperature Materials
- Request for MBA in blended format
What New Platforms and Tools Offer?

Undergraduate Education

- Target special student cohorts
- Mid-year enrollees
- Accelerate academic progress
- Support special experiences – study abroad, internships, co-ops
- Create advanced placement opportunities

Platform + Tools

Multiple New Opportunities

Graduate Education

- Blended Advanced Professional Study
  - MS Degrees
  - Certificates
The Faculty

- Faculty development
- Faculty pay equity
- Merit increases
- Diversity – an important focus
- Women - 23.6%
- Underrepresented groups - 6.3%
- Programs to improve representation
- Pre- and post-doc programs
- Workload normalization
- Continuing commitment to Tenure as an institution
Research/Teaching

- Align faculty hiring to address teaching mission and needs in Signature Research Thrust areas
  - TERM Constellation
  - CISL Constellation
  - IDEA and Jefferson Project
- Critical programmatic needs within the academic units
Student Experience – Core Values

Overarching Goal - Intellectual agility, multicultural sophistication, global view

- Outstanding educational experience
  - Impactful pedagogy
  - Low student faculty ratios (currently 15:1)
- Attract diverse cohorts of students
- Developmental opportunities for students
  - Study-abroad, research, internships
- Pathways to accelerate academic progress
Flexibility in Academic Calendar

Academic plan of study - three specific outcomes
• Pathways for students to accelerate academic progress through the availability of year-round academic calendar
• Enhanced student-faculty interactions at the most critical phase of the undergraduate experience
• Room in the academic schedule for every student to explore their passions and interest in a way that prepares them for leadership and success
Closing Remarks

- Landscape of Higher Education in a state of flux
  - Endogenous and exogenous factors
    - Affordability, costs, regulations, demographics...
- Paradigm shifts underway
  - Comprehensive institutions
    - Link between academics and research
    - Evidence of segmentation
- Changing face of the Professoriate
  - The ‘Invisible University’
    - Birth of The New Polytechnic
- Rensselaer must remain responsive to greatest national needs
  - Serve diverse population groups
  - Meet demand for STEM education
  - Focus on access and meeting financial needs - blended and online instruction, flexible academic calendar
3) Honoring Faculty: Retirees and Faculty Senate (and committee) members: included in #1 above

4) Faculty Comments: Only one person spoke, Professor Chris Bystroff. His comments centered around divesting in fossil fuels. He suggested erecting a large solar panel at Rensselaer that would cost under $7 Million with the payback extending for 12 years.

Professor Holguin-Veras suggested that the sprinkler systems at Rensselaer be programmed to not operate during periods of rain.

Meeting adjourned 4:12pm.