ADVANCE College of Engineering Faculty Retreat

August 7–9, 2024

The Inn at Serenbe

On August 7–9, 2024, 28 members of the Georgia Tech community gathered at The Inn at Serenbe to discuss their vision for the College of Engineering. The participants, pictured and listed in Figure 1 and Table 1, respectively, included faculty, staff and postdocs. The group included 24 members of the College of Engineering and 4 members of the Office of the Provost. Among the 23 faculty members from the College of Engineering, there were 6 assistant professors, 8 professors, 1 postdoctoral fellow, 3 research faculty and 5 academic faculty. The agenda included:

- presentations on CoE faculty data (Kurtis), documenting teaching effectiveness (Barbeau), understanding faculty burnout and vitality (Pope-Ruark), and an overview of Faculty Affairs at Georgia Tech (Bamburowski),
- discussions on PhD student support at Georgia Tech and on priorities for the group and ADVANCE advocacy,
- activities including skits and an art crawl ice breaker

The group divided into five small groups for the priority areas of:

1. Faculty Wellness and Avoiding Burnout
2. Developing New Metrics for Assessing Teaching and Student Learning
3. PhD Student & Postdoctoral Support
4. Institutional Representation and Diversity
5. Enacting Structural Changes at Georgia Tech

Conversations among the group continued over shared meals and social activities. As presented in Section A, the group developed a Call to Action for CoE, based on summaries of the small group discussions as provided in Section B.

Section A: Call to Action for the College of Engineering should

1. Adopt multiple evidence-based measures of teaching and learning that give faculty agency, are scalable across the college, and do not present undue burden to faculty. Reporting of the student opinion survey (CIOS) should not be required.

2. Include research, teaching faculty and postdocs in programs for faculty development, to promote development and avoid faculty burnout for all faculty

3. Establish tools and avenues for graduate students and postdocs to navigate concerns about advisor interactions, or concerns within a research lab/group. Current mechanisms can possibly put the student or postdoc's status and career at risk given the power imbalance and small environment of a research lab.

4. Conduct faculty exit and stay interviews to improve recruiting and retention of faculty from underrepresented groups.

Table 1. Retreat Participants and Affiliations

David	Bamburowski	Office of the Provost (Faculty)	Senior Director of Academic and Research Faculty Affairs
Lauren	Barbeau	Office of the Provost (CTL)	Assistant Director for Learning and Technology Initiatives
Scott	Danielsen	MSE	Assistant Professor
Juanita	Freeman	ChBE	Faculty Support Coordinator
Alpa	Gautam	BME	Lecturer
Rosario	Gerhardt	MSE	Professor
Martha	Grover	ChBE	Professor
Angshuman	Guin	CEE	Principal Research Engineer
Joy	Harris	ECE	Director of Women in Engineering
Tequila	Harris	ME	Professor
Jennifer	Hasler	ECE	Professor
Laura	Haynes	ECE	Senior Academic Professional
Diley	Hernandez	Office of the Provost (Academic Effectiveness)	Associate Vice Provost for Strategic Initiatives
Emma	Hu	MSE	Assistant Professor
Suhas	Jain	ME	Assistant Professor
Pinar	Keskinocak	ISyE	Professor
Kim	Kurtis	CEE	Professor
Shucong	Li	MSE	Assistant Professor
Sharmistha	Mukhopadhyay	NE	Academic Professional
Rebecca	Pope-Ruark	Office of the Provost (Faculty)	Director of the Office of Faculty Professional Development
Lakshmi	Raju	ECE	Academic Professional
Rosemarie	Santa González	ISyE	Postdoctoral Fellow
Mathieu	Tanneau	ISyE	Research Engineer
Anju	Toor	MSE	Assistant
May	Wang	BME	Professor
Julia	Yang	ChBE	Assistant Professor
Bo	Yang	ME	Senior Research Scientist
Shannon	Yee	ME	Professor

Organizing committee: LaJauna Ellis, Juanita Freeman, Martha Grover, Joy Harris, Jennifer Hasler, Raghu Pucha, Lakshmi Raju, Rosemarie Santa González

Figure 1. Retreat Participants

Section B: Small Group Summaries

1. Faculty wellness and avoiding burnout

Working group members: Kim Kurtis, Diley Hernandez, David Bamburowski, Emma Hu, Bo Yang, Angshuman Guin, Joy Harris

Introduction

Faculty wellness is essential to the success and sustainability of any academic institution. At Georgia Tech, our faculty members play a critical role in driving innovation, fostering student growth, and advancing research. However, increasing frustrations regarding workload, salary inequities, and lack of support have heightened the risk of faculty burnout. This portion of the white paper explores the key challenges contributing to faculty burnout and provides recommendations for fostering a healthier and more supportive work environment.

Frustrations

The working group identified several primary frustrations that contribute to faculty burnout:

1. **Salary Inequities**: There is growing dissatisfaction due to salary disparities when compared to market standards, across different units within the university, and between recent hires and long-standing faculty members. Additionally, comparisons with peer institutions reveal further discrepancies that contribute to low morale.
2. **Workload**: Faculty members are increasingly burdened with high workloads that encompass teaching, research, and administrative duties. The lack of adequate time and resources to balance these responsibilities exacerbates stress levels.
3. **Funding Issues**: Securing adequate funding for graduate students and summer salaries remains a significant challenge. The variability in post-tenure review processes across units further compounds the pressure on faculty.
4. **Lack of Administrative Support**: Faculty members report insufficient administrative support, which results in increased time spent on non-academic tasks. This issue is particularly pronounced in research faculty where the absence of a safety net for funding creates additional strain.
5. **Staffing Concerns**: The lean staffing structure within many departments leads to over-reliance on a few individuals, increasing the risk of burnout among both faculty and staff.

Tools and Resources

To address these challenges, the following tools and resources have been identified as potential solutions:

1. **Faculty Burnout Support Group**: Establishing a support group for faculty members to share experiences and coping strategies could provide emotional and mental health benefits.
2. **Flexible Time Away**: Offering more flexibility with time away from campus, including sabbaticals and reduced teaching loads, would allow faculty to recharge and focus on long-term projects.
3. **Faculty Development Grants**: Providing grants that allow faculty to take 1-2 semesters with no teaching obligations would enable them to concentrate on research or professional development.
4. **Mentorship Initiatives**: The implementation of a robust mentorship structure, such as the Mentorship Committee within the School of Materials Science and Engineering (MSE), offers critical support for pre-tenure faculty. This includes assigning mentors in research, senior leadership, and peer support roles, and a teaching mentor to guide new faculty.
5. **Award Committees**: Award Committees within multiple units ensure that faculty, staff, and student achievements are recognized and rewarded, contributing to job satisfaction and career progression.

Recommendations

To further support faculty wellness and reduce burnout, the working group recommends the following actions:

1. **Accelerate Faculty Development Grants**: Consider making these grants available earlier in a faculty member's career and extend eligibility to non-tenure-track (NTT) faculty, as well as research faculty.

2. **Standardize Post-Tenure Review**: Collect and disseminate best practices for post-tenure review to ensure consistency and fairness across all units. Consider training committee members. Also, aim to reduce the burden on the units and faculty review committees.
3. **Establish an Overhead Fund for Research Faculty**: Create a fund to serve as a financial safety net for research faculty, possibly funded by a slightly higher percentage of overhead costs. Research faculty could also pool resources to support one another during funding shortfalls.
4. **Reduce Staff Turnover**: Develop incentives aimed at reducing staff turnover, such as competitive salaries, professional development opportunities, and recognition programs. A stable and experienced staff is crucial to maintaining a supportive environment for faculty.

Conclusion

Faculty wellness is not just an individual concern; it is a collective responsibility that impacts the entire academic community. Addressing the frustrations that contribute to burnout and providing the necessary tools, resources, and support systems are vital steps in fostering a healthy work environment. By implementing the recommendations outlined in this white paper, Georgia Tech can lead the way in promoting faculty wellness and ensuring the long-term success of its academic mission.

2. **Developing New Metric for Assessing Teaching and Student Learning**

Team: Lauren Barbeau, Alpa Gautam, Tequila Harris, Jennifer Hasler, and May D. Wang

1. **<u>Stakeholder Analysis</u>**
    a. The GT leadership: to train highly techsavvy graduates, to protect GT's reputation to the outside world, to increase GT alumni's return to Georgia Tech, it is important to improve the student experience and graduate technical competitiveness in the world, under Georgia Tech's new institute strategic initiative. The assessment needs to align with this overall strategic vision.
    b. Students: to have an effective and accurate measure of the breadth of student learning experience and cognitive depth of learning
    c. Faculty: to get informative and actionable feedback for teaching improvement and instructor growth

2. **<u>Weaknesses of CIOS Effectiveness in Accomplishing GT Mission</u>**
    a. Research indicates that CIOS are biased against minoritized faculty
    b. For GT Institution and leadership: CIOS does not support GT institution strategic priority effectively
    c. CIOS discourages leading edge development and creativity in teaching, discouraging GT faculty from becoming leaders in teaching to correspond with our research excellence.
    d. For GT students: CIOS scores do not measure learning in either
        i. breadth of student learning experience
        ii. cognitive depth of learning
        iii. Students do not receive training in giving feedback
    e. For GT faculty: CIOS scores do not provide informative and actionable feedback for instructor growth and teaching improvement
        i. Feedback is rarely actionable
        ii. Feedback frequently creates anxiety for faculty

3. **<u>Major Threat - Weaponization of CIOS</u>**
    a. CIOS has been perceived to be weaponized to penalize faculty during the process of faculty promotions and tenure, merit increases, and awards
    b. Grade inflation has become observed as one of the negative results
        i. Faculty may artificially inflate student grades in hopes of receiving higher scores
        ii. Students may expect higher grades in return for better reviews
        iii. This creates a negative feedback loop that drives down the quality of both teaching and learning

4. **<u>Opportunities and Value Proposition:</u>**
    Opportunity: GT Strategic Planning
    Build mutual trust among the GT leadership, faculty, and students as main stakeholders of the GT culture.
    a. GT leadership and administrators work together with faculty
        i. To build trust with faculty (solely depending on CIOS as a measure of teaching effectiveness breaks down the trust between faculty and administrators) with multi-faceted approach
        ii. To establish positive, encouraging culture to provide the tools for faculty to train a highly qualified next generation of engineers for society
    b. Determine methods for faculty to build trust with students

i. One way to create trust is on the syllabus, which is assumed to be binding legal document, versus a communication mechanism.

5. **Action-1: Accomplishing Learning Outcome for Objectives**
    a. We need to develop more effective measures on student learning
        i. Course learning objectives should be written using measurable Bloom's verbs
        ii. Course learning objectives should be used to assess student learning outcomes throughout the semester (i.e. assess the alignment of learning outcomes vs learning objectives)
    b. What data could we collect to measure learning?
        i. When course assessments are properly aligned with course content and objectives, student performance on assessments can be used as a measure of learning
        ii. Student artifacts can also be collected as part of an instructor portfolio—final projects, papers, posters, unsolicited feedback to instructors, career placements, etc.
    c. Alignment
        i. Faculty should develop and include in the syllabus measurable learning objectives for each module of their course.
        ii. Learning outcomes should also be included, where learning outcomes are the set of skills and/or conceptual understanding learners should gain from the lesson and/or course.
        iii. Both learning objectives and outcomes should be limited to four to five key concepts that learners should master to lower extraneous cognitive load.
        iv. Learning objectives and outcomes should use actionable verbs. Refer to Bloom's Actionable verbs for reference.
        v. Assessments should align with the established expectations to demonstrate evidence of mastery of the learning module concepts.

6. **Action-2: Reorienting Faculty on Best Teaching Practices**
    a. GT leadership encourages and awards faculty to engage in pedagogical trainings that enhance their teaching abilities
        i. Faculty need support in pedagogy to teach well
        ii. Leadership should recognize, value, and reward faculty efforts to grow as teachers
        iii. Training should not be "required" as an additional demand on faculty but should be incentivized
    b. Reward faculty with credit on continuing education related to teaching and learning, which could be a positive part of the annual evaluation. You must complete so many credits (3+) and receive credit for completing the learning.
    c. GT leadership recognizes and incentivizes those who are doing the work in support of values of teaching and making positive change for the student & faculty culture.

7. **Action-3: Fostering an inclusive classroom environment that acknowledges and values the diverse learning experiences of different groups, such as Black, Latinx, individuals with visible disabilities, and other marginalized communities.**
    a. Inclusive classroom environments increase student sense of belonging, which in turn leads to increased persistence in courses, degree programs, and institutions
    b. When forming learner groups, make sure to include more than one member from the same minoritized group in each group.

c. Learning content should be offered in multiple multimedia formats to ensure accessibility for diverse learners. For instance, providing recorded lectures can be beneficial. This approach is consistent with Mayer's Multimedia Learning Theory, which proposes that the brain processes visual and auditory information through separate channels and integrating these can enhance understanding and retention.

8. **<u>Action-4: Recommending 2+ chosen modes of assessment for evaluating teaching that may or may not include CIOS</u>**
    a. Since CIOS does not measure learning, faculty portfolios should be developed that include at least two modes of assessment from a menu of six options. Options already discussed at GT (and within this group) would include
        i. CIOS (teaching effectiveness)
        ii. Other CIOS measures (not teaching effectiveness)
        iii. publishing in education (peer review)
        iv. self-reflection on education
        v. demonstration of inclusive teaching approaches
        vi. Course observation

        Additional components to be included might be
        vii. syllabus policies
        viii. example assignments
        ix. feedback to students
        x. student performance on assessments, etc.
    b. The choice of materials should be the choice of the faculty member with no negative implications by their particular choice.
    c. CIOS alone cannot be a singular measure, and the submitted materials could be entirely without CIOS.

3. PhD Student & Postdoctoral Support in College of Engineering

Graduate Student Support:

Graduate students and postdoctoral fellows have access to various support mechanisms, including academic advising, mental health services, career counseling, and professional development workshops. However, there is a need for a more structured and comprehensive approach to ensure all students are aware and can access these resources. Creating a centralized repository of resources can significantly enhance the support system. This repository should include information on available services, funding opportunities, workshops, and seminars. It should be easily accessible and regularly updated, and communicated to students. Currently, the graduate office maintains such a list, but could be more specific of the resources available with each reference to support. Additionally, the resource should be more widely advertised not only to students, but programs/faculty to refer to as well.

Faculty members play a key role in guiding students. Ensuring that they are aware of the available resources will enable them to better support and advise their students.

Sharing best practices and support initiatives across College of Engineering (CoE) units can foster a collaborative environment. Understanding the diverse needs of students from different units and

implementing successful strategies can enhance overall support. To effectively support PhD students, it is essential to understand their needs and concerns. Regular surveys and feedback mechanisms can help gather this information, providing insights into the current climate among PhD students. Additionally, analyzing data on PhD student progression can help identify systemic issues and areas for improvement. This data-driven approach can lead to targeted interventions and better support for students.

Establishing a clear advisor-advisee agreement outlining expectations and mentorship standards can improve the advisor-advisee relationship for Ph.D. students and post-docs. This agreement should include base-level expectations for mentorship, career goals and pathways, and regular check-ins. Additionally, training for advisors to mentor graduate students and postdocs to improve the outcome of the graduate and postdoctoral programs as well as reduce conflict. When a PhD student or a post-doc has concerns about the interactions with their advisor, the climate or collegiality in the research group/lab, etc. there does not seem to be a clear mechanism to address such concerns without putting the student/post-doc's status or future career at risk, given the power imbalance. Advisor training as well as increasing awareness among Ph.D. students as to what resources are available to help them navigate potential conflict situations would be helpful.

Introducing a graduate-level seminar focused on essential skills such as cognitive distortions, time management, good habits, conflict resolution, teamwork, etc. can be beneficial. This seminar could be mandatory, similar to undergraduate courses like GT 1000/APPH 1040/1050/1060 and focus on success skills rather than subject matter.

Also, encouraging a culture where advisors support students taking time for seminars and workshops focused on personal development is important. This can help students develop holistically and manage stress effectively. Maintaining a survey of graduate student and postdoc experiences in advisor labs can provide valuable feedback and help improve the lab environment. This can lead to better mentorship and a more supportive research environment.

Suggestions for the Office of Postdoctoral Services

A more structured postdoctoral program with defined checkpoints for mentorship and guidance can enhance the postdoctoral experience. Regular evaluations and feedback sessions can ensure continuous improvement. Therefore, the following recommendations are made to help improve post-doctoral fellows' experience:

1. Systematic entry and exit interviews for post-doctoral fellows, conducted through HR and/or the Office of Post-Doctoral Services.
   These interviews will provide valuable data about post-doctoral fellows' path at Georgia Tech, and about the alignment of their initial career goals with their overall experience at Georgia Tech;
2. A 6-month interview (ideally conducted by someone who is not affiliated with the post-doc advisor's unit), to help monitor postdocs' well-being and provide an opportunity to address any potential issues promptly;
3. Support for post-docs planning to enter the academic job market, including career counseling, resume workshops, and networking opportunities.

Additionally, providing guidance to PhD students about the postdoctoral program, including what to request or negotiate in offers, program expectations, and available support from the Office of Postdoctoral Services, can help them transition smoothly.

4. **Institutional Representation and Diversity**

We examine issues pertaining to equitable representation within the classroom, research infrastructure, and faculty/administration at the Georgia Institute of Technology.

I) Research group:
   a. Theme #1: **How do we incentivize research teams to concretely value Representation and Diversity?**
      i. Context: Diverse teams are important for enhanced innovation and creativity, thorough decision-making, increased team member engagement, and being adaptable and resilient to new problems.
      ii. Issue: Diversity does not always equate to representation. For instance, within a research group, women and underrepresented minorities can be forgotten in creating collaborations, discussions, leading to loss of inclusivity. Over time this may lead to loss of faith in the group from women and underrepresented minorities.
      iii. Solution: Use publicly accessible information to track how well teams are being represented. Track metrics such as: average number of papers published in a lab per year for students who are underrepresented minorities vs. their peers; the sizes of their teams; the "network of co-authors (size, diversity, seniority)" for each student/postdoc. Conveniently, this information is already publicly available; the next step is to curate.
   b. Theme #2: **How do we assign merit to the professional and emotional support carried by under-represented minorities?**
      i. Issue: Women and under-represented minorities are unfairly leaned upon to provide support (sometimes daily, weekly) to students who recognize them as sources of wellbeing. This leads to unfair allocation of time, personal energy, and attention, compared to their colleagues, compromising time spent on research.
      ii. Solution: Several pathways are possible: 1) Set up awards. 2) Make sure PIs are aware of this duty as an unavoidable aspect of mentorship, which has largely gone unnoticed at Tech. Acknowledge this *at the institutional level*, such as through a Letter of Recommendation from the Dean for postdocs applying to faculty positions, or recognition of Service for faculty members. 3) The faculty should make allies/bridges/connections with other faculty and refer them as external resources for their students in times of need.

II) Classroom:
   a. Theme: **How do we self-correct when our goals for fair and equitable classrooms are still not being met (i.e. why do race/ethnicity (and other under-represented backgrounds) remain predictors of grades)?**
      i. Context: It is essential to create fair, inclusive, and equitable environments in the classroom where all students can succeed, regardless of background or identification.
      ii. Issue: Different groups of students will utilize campus support resources differently. For example, all students nominally have access to accommodations through the Office of Disability Services, but there are barriers to equitable utilization due to costs associated with documentation. As a result, resource allocation efforts can miss their intended target audience and unintentionally reaffirm systemic barriers for under-represented groups.
      iii. Solution: Ensure that campus resources can be equitably accessed by all students. - Survey students who have contacted or attempted to use different resources, but did

not complete the process? - Check if the students using different resources are representative of the larger student population?

5. **Enacting Structural Changes at Georgia Tech**

Discussing criteria for a program to become a new School within the College of Engineering
There are numerous Programs within the College of Engineering that, at some point, may become a new School. This white paper documents the thoughts and discussion around criteria that could be considered in making that decision. To our knowledge there are at least four programs: robotics, machine learning, nuclear and radiological engineering, and bioengineering, that at some point may want to evolve into a School.

In our discussion, we think that some criteria for this decision are:

- A cohort of dedicated faculty (around 10) that desire change
- Addition faculty support for the desired change outside the cohort (i.e., petition of 50 signatories)
- Core curriculum exists with degree requirements
- A sound financial business model that is sustainable under the current resource allocation model
- Location and space available for growth with requisite specialized facilities
- Student and industry demand for the degrees
- Emergence or re-emergence of disciplinary interest amongst peers
- (ABET) Accreditation of the program

Once the above criteria is met, what would be the next steps? The Dean would create a formal Task Force that is charged with making a recommendation, listing the pros and cons. Based on the recommendation, the Dean could begin the formal process of the creation of a new School.

Discussing criteria for IRI's to coalesce into a single IRI
There are 9+ Interdisciplinary Research Institutes (IRIs) and more may be established. Externally, there seems to be some degree of overlap between the focus areas and mission, where a distinguishing characteristic is there name and leadership. This white paper documents the thoughts and discussion around criteria that could be considered in making a decision to coalesce IRIs.

In our discussion, we think that some criteria for this decision are:

- Common impact area (e.g., sustainability, energy, and climate)
- Common cross-cutting faculty affiliation
- Centers within the IRI decrease below five
- High overlap of shared resources

Once the above criteria are met, what would be the next steps? The VP of IR would create a formal Task Force that is charged with making a recommendation, listing the pros and cons. Based on the recommendation, the VP of IR could begin the formal process of coalescence.