



Building an RDI at your institution

PARTICIPANT WORKBOOK



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Program Introduction

Learning Objectives

By attending this workshop we are expecting our participants to be able to

1. Identify the current Rising Doctoral Institute (RDI) model.
2. Create an initial design of the RDI for your institution.
3. List the answers you need from your institution to help you complete implement the RDI.
4. Develop an action plan to complete and implement the RDI at your institution.

Program Components

We will achieve these goals through the following Modules:

Module 1 – March 28th *What is the RDI?*

An introduction of our RDI Model, our team, and our participants

Institutional Cultures 1

A new mindset for understanding change

Module 2 – Apr 4th *Institutional Cultures 2*

How the RDI can leverage change in your institution?

An activity to recognize how motivating individuals to change behaviors is the key to cultural change

Module 3 – Apr 11th *Addressing the Students' needs*

A discussion about the RDI participants and their needs as incoming doctoral URM students

Module 4 – Apr 18th *Planning your RDI*

Start to formalize the plan for your RDI

Module 5 – Apr 25th *Planning your RDI 2*

Identifying the people, location and timeline to facilitate the RDI, and how the RDI project could provide support to your local RDI

Module 6 – May 2nd *Planning your RDI 3*

Complete the plan

Evaluation of the workshop

Module 7 – June 16th *Planning your RDI 4*

Finalize your Plan

Adding principles of Cultural Change in your RDI implementation

How to Assess & Evaluate your RDI

Disclaimer

Most of the information presented in this program represents the opinion of the program development team and is not an official NSF position.

This is an ongoing workbook, we will be adding elements to it each week before each of the modules.

You can download it and print it to conduct the activities, but we encourage you to use this online version to collaborate easily with the colleague at your institution

Session I: Institutional cultures

Session Overview

Goal

The goal of this session is to give you an introduction to our RDI Model, our team, and our participants. Also, provide a new mindset for understanding change at your institution.

A New Mindset for Understanding Change – Overview

If the only tool you have is a hammer, you tend to see every problem as a nail

Abraham Maslow

Mindset is a mental attitude or inclination, or a fixed state of mind.

Merriam-Webster Dictionary

Often we, academicians, frame every challenge as research and our challenge is to find “the” answer or at least discover more clarity about the challenges we face. Typically we:

- ☐ Define the characteristics of the problem;
- ☐ Find the literature on the problem, and sometimes the history of the problem;
- ☐ Hypothesize on a solution, or the better or more refined data we need;
- ☐ Run an experiment and assess and evaluate its efficacy;
- ☐ Iterate till the results of the experiment look good (at least good enough).

THEN WE THINK Q.E.D. The proof is complete so the proposed solution will be adopted. Often, we are surprised when our colleagues do not look at our results and adopt our findings.

The five steps above, or similar steps, are necessary but not sufficient to change your organization. We challenge you to also ask, “**why will people change their own behaviors.**”

People change because they are shown a truth that influences their feelings, not because they are given endless amounts of logical data.

John Kotter

Several change experts have indicated that the pain, or threat, of complacently continuing to do what has been working so far has to feel worse than the effort, and discomfort, of having to learn a new way of doing something. Furthermore, we have to trust the source informing us about real or projected pain and that if we change we will land in a better, not worse, spot.

People buy into the leader before they buy into the vision.

John Maxwell

To get people to let go of the assumption that what is working is good enough, Osborne and Plastrik said we must:

- ☐ Let anomalies stack up (events where the current approach does not work well)
- ☐ Create dissonance about the anomalies
- ☐ Give an idea of a good landing place if we change

Until the people we want to change feel like it is going to be good for them to exert the effort to change, they will resist. Resistance will vary in intensity depending on their perception of what you are asking them to change, and their resistance will be demonstrated in many ways. Rick Maurer stated the levels of resistance are based on whether they perceive the change to be:

- ☐ Centered on ideas that we don't fully understand or believe
- ☐ Centered on emotions ignited from feeling undervalued, isolated, taken advantage of, disrespected; or
- ☐ Centered on deeply embedded issues like historical animosity, basic values, or conflicting goals.

Therefore, your RDI team must not only **identify the problem, develop solutions, execute a plan, and then assess your results**. You must do the detective work on

who are the people that need to change, and why these people are most likely to change their behavior. Some of the detective work includes:

- ☐ Who is going to have to change
- ☐ Why will they resist changing
- ☐ Who do they trust
- ☐ What would motivate them to change

Then, you must design an adaptable change strategy and plan.

Activities

Please read this scenario and answer the follow-up questions

Scenario 1: Changing the typical time for a class

Our perspective:

Our faculty colleagues often complain that it seems the students learn very little in the lower-level courses. We evaluated this concern and found topics were being covered, but the students had trouble remembering what was covered as they were asked to apply topics in the following courses. In our desire to deepen the students learning, and after reviewing much literature, we decided to engage students in early engineering science courses in a “studio format”-meaning in the same class period we went directly from the theoretical information to a hands-on experiential exercise of the theory. It was successfully piloted so we raised funds and modified a classroom so experiential stations were on the edge of the room where a lecture could be given. Many of the courses were formatted, for 3 credits, to be taught as 2 - 50 minutes lectures and 1- 3 hour lab, in which the students almost always finished in 2 hours. Finally, we observed that if we kept the students for a full 2 hours twice a week, instead of the typical blocks of time, we created a better, deeper learning experience for the students. So we requested the Registrar let us schedule 5 engineering science courses in the converted classroom in these new time blocks.

Without any deep discussion, he said no, so we got the Dean to convince the Provost to let us do this new scheduling format.

Registrar's perspective:

He had worked to get all classrooms centrally controlled, instead of each department controlling a set of classrooms, so that campus resources could be used more efficiently. He had software that helped schedule classes in appropriately sized rooms, as close to the home department as possible. This tool worked very poorly when people selected different sizes for the time slots in classes. If he let engineering change the mold, then everyone would want to. This new provost that ordered him to accommodate this group of faculty doesn't understand the bad precedent he is setting.

Provost's perspective:

I don't have time to worry about the scheduling of 5 courses, and the Dean said she didn't have time either, but since external funds were raised, we should follow through for at least a couple of years, and we will worry about whether to continue or not in the future.

Scenarios are copyrighted by The Abura Group, LLC and used by permission of Karan Watson, partner.

(Think - pair - share)

- 1. How do you think the Registrar reacted to the order coming from the "big guns"?**
- 2. Why the Registrar might think he is being reasonable when resisting the change?**

Please don't read this part until prompted by the facilitator

Further information found on Registrar's perspective

He worked very hard to centralize assigning of classrooms centrally. His reasons were because when each unit controlled their classrooms:

- As enrollments varied over time units wanted more classrooms even though some rooms on campus were being underutilized,
- There were not enough large (80+) classrooms on campus for all units that wanted one to have one, and most units did not want these large rooms for every time slot during the week,
- The State required him to file a classroom report every year (for each classroom and each time slot between 8-5 M-F, what percentage of rooms were over 70% full and what percent under 30% full. The State had recently told the University they couldn't request more funds for classrooms because there was no efficient use of the rooms already built.

(Think - pair - share)

3. Think through strategies to help the program admin to move forward knowing this rationale.

Scenario 2: Utilizing the GRE for admitting graduate students to our Ph.D. program

The graduate admission subcommittee's perspective on improving size and diversity of graduate enrollment:

The GRE scores are not a good predictor of grades or persistence in the Ph.D. program (it accounts for less than 10% of the variance in grade point averages for students, and has a negligible contribution to the likelihood of completing the degree). We have heard from 'non-traditional prospective students for our Ph.D. program, particularly working engineers from nearby communities, that the major reason they do not consider enrolling, even part-time, in our program, is the burden of the admission process, particularly taking the GRE. We notice from the data that the pool of these working engineers, who have some interest in an advanced degree, is over 400 individuals, and is much more diverse than our current enrollment. We propose to the department chair that we wave the GRE requirement for working engineers who graduated from an ABET-accredited program or the equivalent. The chair has us present the idea at a faculty meeting.

Five senior faculty members, three of whom are our most prolific researchers with a disproportionately large proportion of the current Ph.D. students in the department working in their labs, spoke adamantly against our proposal. The department chair said we would postpone the decision on our proposal until we have more discussions. We have had two more faculty meetings and the chair has not put our proposal on the agenda for discussion. If we don't decide in the next two months we will miss the major cycle for graduate admissions for another year.

The three most prolific researchers' perspectives

When you get funding from external sources you have little trouble recruiting good Ph.D. students from the applicants we already receive. Even though these applicants are overwhelmingly from students graduating from schools in other countries, the GRE seems to work well to determine that the applicant can handle our courses and write well. This is important since we can't know about the rigor of every institution the applicants come from, and this would seem to be true for US institutions as well.

The Department Chair's perspective

Two of the most prolific researchers required a counter offer in the last 3 years so they did not accept an offer to go elsewhere.

The Dean announced that even though departmental rankings are based purely on peer perceptions, the College ranking has both peer perceptions and objective data like selectivity of students and average GRE scores. She let the chairs know they need to do better on these objective values.

Finally, the admissions office does not like departments waiving the GRE.

(Think - pair - share)

4. Why the resistors might think they are being reasonable when resisting the change?

Please don't read this part until prompted by the facilitator

A more in-depth rationale of the resistors

- ☐ We found out that the school got sued before because a wealthy student from the State didn't get accepted into the program, and this student's father, a large donor to the university, was outraged that international students were admitted before US citizens.
- ☐ The GRE was the only metric the university could use that served to weigh and predict international applicants compared to US citizens.
- ☐ The upper administration, worried about being sued again, told the admissions office not to tolerate much variance around the GRE for admitted students for a program.
- ☐ Our team was not opposed to applicants taking the GRE, but wanted the scores to be weighed less for students from US institutions, especially when such admissions would help recruit more and more diverse US citizens.

(Think - pair - share)

5. Knowing this rationale, identify strategies to help the program admin to move forward.

Session II: What you graduate students need: Going from the literature to identifying workshop topics

1. Goal

The goal of this session is to develop a list of workshops for your institution's RDI based on the needs identified from prior research as well as the needs you previously identified in your institution.

2. Learning Objectives

- Understand the graduate student development process
- Discuss the impact of misalignments of expectations in graduate school
- Describe the five main topic areas of misalignments in URM doctoral students
- Identify the resources currently available in my institution
- Build a workshop list for my RDI

3. Key Definitions

- Misalignment: When a student's beliefs are not aligned with their academic reality.
- Misconception: A belief that is incorrect to the academic reality.
- Topic areas: Overarching categories of workshops sessions grouped in topic areas.
- Resources: Existing workshops, resources, offices, or supports available on campus.
- Institutional Context: Your individual university and its opportunities and constraints.

4. Introduction to Graduate Student Needs

Graduate Student Development

Students go through four stages as they progress in the doctorate:

1. Anticipatory Stage:
2. Formal Stage:
3. Informal Stage:
4. Personal Stage:

Expectation Misalignment and Possible Outcomes

When students enter the doctorate, they often possess three main categories of misconceptions:

1. Task:
2. University:
3. Personal:

5. Topic Area 1 – Doctoral Program Management

Key Takeaways

- Students enter graduate school with misconceptions that can ultimately impact their persistence. Having a clear understanding early on can help them make critical decisions conscientiously. (Holbrook et al., 2014; Lovitts, 2001)
- Funding types and management has been shown to impact the doctoral experience and time to degree (Knight et al., 2018; Ferrer de Valero, 2001). In the case of minoritized students specifically, the investments made to attend doctoral education often extend beyond the financial (Artiles et al., 2018).
- The doctoral advisor is one of the most important decisions students make in the doctorate, and the process of selecting an advisor is often complex (Artiles, 2019).

Suggested readings

- Artiles, M. S., Matusovich, H. M., Bey, C. J., & Adams, S. G. (2018). Understanding the Investment of Underrepresented minorities in Doctoral Engineering Programs. American Society for Engineering Education, Salt Lake City, UT.
- Artiles, M. S. (2019). Advisor Selection Processes in Doctoral STEM Programs in the US [Dissertation.]. Virginia Polytechnic Institute and State University.
- Ferrer de Valero, Y. (2001). Departmental Factors Affecting Time-to-Degree and Completion Rates of Doctoral Students at One Land-Grant Research Institution. The Journal of Higher Education, 72(3), 341. <https://doi.org/10.2307/2649335>
- Holbrook, A., Shaw, K., Scevak, J., Bourke, S., Cantwell, R., & Budd, J. (2014). PhD candidate expectations: Exploring mismatch with experience. International Journal of Doctoral Studies, 9, 329–346.
- Knight, D., Kinoshita, T. J., Choe, N., & Borrego, M. (2018). Doctoral student funding portfolios across and within engineering, life sciences and physical sciences. Studies in Graduate and Postdoctoral Education, 9(1), 75–90. <https://doi.org/10.1108/SGPE-D-17-00044>

Answer the following questions relating to Doctoral Program Management:

- *Think about your institutional context. What easily available resources do you have on your campus?*
- *Keeping in mind what you have readily available, how many workshops/topic sessions do you need to fully cover this topic?*
- *If a workshop doesn't already exist for a specific topic, who from your campus comes to mind to help facilitate a conversation(s) around this topic?*
- *If you can't think of a local resource, which external collaborator might you employ for assistance?*

6. Topic Area 2 – Advising and Interpersonal Relationships in Graduate

Key Takeaways

- Maintaining a positive advising relationship is a key factor for student retention. Learning how to handle disagreements has been shown to increase persistence (Barker, 2011; Devos et al., 2016; Zhao et al., 2007).
- Awareness of the broader departmental politics and environment can be key in the development of graduate students and their persistence (Berdanier et al., 2020; Golde, 2005; Sowell et al., 2015; Weidman et al., 2001; Zhou & Okahana, 2016). Minoritized students in engineering have been found to struggle with this awareness (Twale et al., 2016; Wood et al., 2016).

Suggested readings

- Devos, C., Boudrenghien, G., Van der Linden, N., Frenay, M., Azzi, A., Galand, B., & Klein, O. (2016). "Misfits between doctoral students and their supervisors:(How) are they regulated? International Journal of Doctoral Studies, 11.
- Barker, M. J. (2011). Racial context, currency and connections: Black doctoral student and white advisor perspectives on cross-race advising. *Innovations in Education and Teaching International*, 48(4), 387–400. <https://doi.org/10.1080/14703297.2011.617092>
- Berdanier, C. G., Whitehair, C., Kirn, A., & Satterfield, D. (2020). Analysis of social media forums to elicit narratives of graduate engineering student attrition. *Journal of Engineering Education*, 109(1), 125–147. <https://doi.org/10.1002/jee.20299>
- Golde, C. M. (2005). The Role of the Department and Discipline in Doctoral Student Attrition: Lessons from Four Departments. *The Journal of Higher Education*, 76(6), 669–700. <https://doi.org/10.1080/00221546.2005.11772304>
- Twale, D. J., Weidman, J. C., & Bethea, K. (2016). Conceptualizing Socialization of Graduate Students of Color: Revisiting the Weidman-Twale-Stein Framework. *Western Journal of Black Studies*, 40(2).
- Wood, C. V., Campbell, P. B., & McGee, R. (2016). "An Incredibly Steep Hill": How Gender, Race, and Class Shape Perspectives On Academic Careers Among Beginning Biomedical PhD Students. *Journal of Women and Minorities in Science and Engineering*, 22(2). <http://www.dl.begellhouse.com/journals/00551c876cc2f027,42bf45761aa16485,3569f89030434b39.html>
- Zhao, C.-M., Golde, C. M., & McCormick, A. C. (2007). More than a signature: How advisor choice and advisor behaviour affect doctoral student satisfaction. *Journal of Further and Higher Education*, 31(3), 263–281.
- Zhou, E., & Okahana, H. (2016). The Role of Department Supports on Doctoral Completion and Time-to-Degree. *Journal of College Student Retention: Research, Theory & Practice*, 152102511668203. <https://doi.org/10.1177/1521025116682036>

Answer the following questions relating to Advising and Interpersonal Relationships:

- *Think about your institutional context. What easily available resources do you have on your campus?*
- *Keeping in mind what you have readily available, how many workshops/topic sessions do you need to fully cover this topic?*
- *If a workshop doesn't already exist for a specific topic, who from your campus comes to mind to help facilitate a conversation(s) around this topic?*
- *If you can't think of a local resource, which external collaborator might you employ for assistance?*

7. Topic Area 3 – Day to Day Strategies for Graduate School Success

Key Takeaways

- Shifting from a prescribed schedule and explicit assessment guidelines in the undergraduate to a hidden process at the doctoral level is often a barrier for students who lack self-management (Gardner, 2008; Gardner & Holley, 2011; Wood et al., 2016).
- The writing process can often be a challenge for engineering doctoral students as they may not have developed these skills in the undergraduate (Berdanier, 2016; Berdanier & Zerbe, 2018).

Suggested readings

- Berdanier, C. G. (2016). Learning the language of academic engineering: Sociocognitive writing in graduate students. Purdue University.
- Berdanier, C. G., & Zerbe, E. (2018). Quantitative Investigation of Engineering Graduate Student Conceptions and Processes of Academic Writing. 2018 IEEE International Professional Communication Conference (ProComm), 138–145.
- Gardner, S. K. (2008). “What’s Too Much and What’s Too Little?”: The Process of Becoming an Independent Researcher in Doctoral Education. *The Journal of Higher Education*, 79(3), 326–350. <https://doi.org/10.1353/jhe.0.0007>
- Gardner, S. K., & Holley, K. A. (2011). “Those invisible barriers are real”: The Progression of First-Generation Students Through Doctoral Education. *Equity & Excellence in Education*, 44(1), 77–92. <https://doi.org/10.1080/10665684.2011.529791>
- Wood, C. V., Campbell, P. B., & McGee, R. (2016). “An Incredibly Steep Hill”: How Gender, Race, and Class Shape Perspectives On Academic Careers Among Beginning Biomedical PhD Students. *Journal of Women and Minorities in Science and Engineering*, 22(2). <http://www.dl.begellhouse.com/journals/00551c876cc2f027,42bf45761aa16485,3569f89030434b39.html>

Answer the following questions relating to Day to Day Grad School Success:

- *Think about your institutional context. What easily available resources do you have on your campus?*
- *Keeping in mind what you have readily available, how many workshops/topic sessions do you need to fully cover this topic?*
- *If a workshop doesn't already exist for a specific topic, who from your campus comes to mind to help facilitate a conversation(s) around this topic?*
- *If you can't think of a local resource, which external collaborator might you employ for assistance?*

8. Topic Area 4 – Being Minoritized in Graduate School

Key Takeaways

- Minoritized doctoral students often experience impostor syndrome and lack belongingness (Felder et al., 2014; Gildersleeve et al., 2011; Jaeger et al., 2017). The continuity of these feelings can develop mental health issues (Levecque et al., 2017) and impact doctoral progress (Artiles & Matusovich, 2020).
- Managing such and creating support systems such as peer groups and mentoring relationships can help students manage to be visibly different from the norm in academia and persist in the doctorate (Ahn, 2016; Holloway-Friesen, 2019; Mondisa et al., 2015).

Suggested readings

- Artiles, M. S., & Matusovich, H. M. (2020). Examining Doctoral Degree Attrition Rates: Using Expectancy-Value Theory to Compare Student Values and Faculty Supports. *International Journal of Engineering Education*, 36(3), 1071–1081.
- Ahn, B. (2016). Applying the Cognitive Apprenticeship Theory to Examine Graduate and Postdoctoral Researchers' Mentoring Practices in Undergraduate Research Settings. *International Journal of Engineering Education*, 32(4), 1691–1703.
- Felder, P. P., Stevenson, H. C., & Gasman, M. (2014). Understanding race in doctoral student socialization. *International Journal of Doctoral Studies*, 9(19), 21–42.
- Gildersleeve, R. E., Croom, N. N., & Vasquez, P. L. (2011). "Am I going crazy?!": A critical race analysis of doctoral education. *Equity & Excellence in Education*, 44(1), 93–114.
- Holloway-Friesen, H. (2019). The Role of Mentoring on Hispanic Graduate Students' Sense of Belonging and Academic Self-Efficacy. *Journal of Hispanic Higher Education*, 153819271882371. <https://doi.org/10.1177/1538192718823716>
- Jaeger, A. J., Mitchall, A., O'Meara, K. A., Grantham, A., Zhang, J., Eliason, J., & Cowdery, K. (2017). Push and pull: The influence of race/ethnicity on agency in doctoral student career advancement. *Journal of Diversity in Higher Education*, 10(3), 232–252. <https://doi.org/10.1037/dhe0000018>
- Levecque, K., Anseel, F., De Beuckelaer, A., Van der Heyden, J., & Gisle, L. (2017). Work organization and mental health problems in PhD students. *Research Policy*, 46(4), 868– 879. <https://doi.org/10.1016/j.respol.2017.02.008>
- Mondisa, J.-L., Brown, C., & Adams, R. (2015). Mentoring African-American Science, Technology, Engineering, and Mathematics (STEM) Undergraduates: An African- American STEM Mentor's Perspective. 26.1146.1-26.1146.11. <https://doi.org/10.18260/p.24483>

Answer the following questions relating to Being Minoritized in Grad School:

- *Think about your institutional context. What easily available resources do you have on your campus?*
- *Keeping in mind what you have readily available, how many workshops/topic sessions do you need to fully cover this topic?*
- *If a workshop doesn't already exist for a specific topic, who from your campus comes to mind to help facilitate a conversation(s) around this topic?*
- *If you can't think of a local resource, which external collaborator might you employ for assistance?*

9. Topic Area 5 – Life Post Ph.D.

Key Takeaways

- Over 70% of engineering and other STEM doctorate holders have been shown to pursue careers outside of academia, such as industry and government (Turk-Bicakci et al., 2014).

Suggested readings

- Turk-Bicakci, L., Berger, A., & Haxton, C. (2014). The nonacademic careers of STEM PhD holders.

Answer the following questions relating to Career Post PhD:

- *Think about your institutional context. What easily available resources do you have on your campus?*
- *Keeping in mind what you have readily available, how many workshops/topic sessions do you need to fully cover this topic?*
- *If a workshop doesn't already exist for a specific topic, who from your campus comes to mind to help facilitate a conversation(s) around this topic?*
- *If you can't think of a local resource, which external collaborator might you employ for assistance?*

10. Summative Considerations

- *What additional areas did you identify earlier that you should include in your RDI?*
- *Think about your institutional context. What easily available resources do you have on your campus?*
- *Keeping in mind what you have readily available, how many workshops/topic sessions do you need to fully cover this topic?*
- *If a workshop doesn't already exist for a specific topic, who from your campus comes to mind to help facilitate a conversation(s) around this topic?*
- *If you can't think of a local resource, which external collaborator might you employ for assistance?*
- *What resources can you think of that you might want to include but don't fall into the original areas?*
- *Is there a way to tweak existing resources to meet your needs?*

11. Based on the answers above, this is my preliminary list of actions:

RDI Workshop Topics

This table shows the RDI workshops based on the needs identified from prior research on graduate students. It is organized in the 5 areas of expectation misalignments. It includes the recorded sessions of the Initial RDI (virtual) we held in 2021. We are providing these recordings to give more details on what was discussed in the workshops, they are intended for study and guidance purposes only.

Topic Area	Key Takeaways	RDI 2021 - Recorded Sessions	Facilitators
Doctoral Program Management	➤ Students enter graduate school with misconceptions that can ultimately impact their persistence. Having a clear understanding early on can help them make critical decisions conscientiously. ➤ Funding types and management has been shown to impact the doctoral experience and time to degree. In the case of minoritized students specifically, the investments made to attend doctoral education often extend beyond the financial. ➤ The doctoral advisor is one of the most important decisions students make in the doctorate, and the process of selecting an advisor is often complex	➤ Getting Off to a good start in grad school: High level overview of graduate school and its purpose ➤ Finding and Managing Funding: Overview of what it means to be funded and how to keep it ➤ Selecting and Advisor and Committee: Factors to consider in both processes	Dr. Howard Adams Dr. Sharnnia Artis Dr. Mayra Artilles
Advising and Interpersonal	➤ Maintaining a positive advising relationship is a key factor for student retention. Learning how to handle disagreements has been shown to increase persistence.	➤ Establishing and maintaining a healthy advising relationships – Overview of how to sustain a healthy advising relationship and understand the responsibilities that come with being an advisee.	Dr. Jeremi London

Relationships in Grad School	➤ Awareness of the broader departmental politics and environment can be key in the development of graduate students and their persistence. URM students in engineering have been found to struggle with this awareness.	➤ Tips from the top – Open and honest Q&A to help understand the broader picture of institution and departmental structure and to an extent politics.	Dr. Holly Matusovich Dr. Stephanie Adams
Day to Day strategies for grad school success	➤ Shifting from a prescribed schedule and explicit assessment guidelines in the undergraduate to a hidden process in the doctoral level is often a barrier for students who lack self-management. ➤ The writing process in particular can often be a challenge for engineering doctoral students as they may not have developed these skills in the undergraduate.	➤ Managing Time and Procrastination: Overview on strategies at both at the degree level and also daily level on how to optimize how they spend their time. ➤ Engaging with the literature: How to find and read the literature as well as an overview of the publication process	Dr. Marquita Qualls Dr. Gwen Lee Thomas Dr. Juan Cruz Dr. Mayra Artilles Dr. Susan Lord
Being minoritized in Grad School	➤ URM doctoral students often experience impostor syndrome and lack belongingness. The continuity of these feelings can and develop mental health issues and impact doctoral progress. ➤ Managing such and creating support systems such as peer groups and mentoring relationships can help students manage being visibly different than the norm in academia and persist	➤ Finding Balance - Navigating Engineering Doctoral Programs while Enhancing Cultural Capital: How to reconcile who I am and my identities with the doctoral journey where everyone looks differently than me. ➤ Mental Health in Grad School: How to keep it and how to identify threats to it. ➤ Coaching Sessions (no recording, this was accomplished with the success groups or individual sessions): A chance for private debriefing with staff who had been through the	Dr. Homero Murzi Dr. Morgan McCain

	in the doctorate.	process.	
Life post PhD	➤ Over 70% of engineering and other STEM doctorate holders have been shown to pursue careers outside of academia such as industry and government. ➤ Academic careers in the PhD have been shown to be more likely when students follow specific pathways within the academy and seek specific experiences.	➤ Career Options with a PhD: This session discusses potential careers in government, industry, and academia for STEM Ph.D. holders, as well as how to translate learning objectives in the doctoral pursuit beyond academia.	Dr. Javier Kypuros Dr. Stephanie Adams

Session III-VI: Planning Your RDI

1. Goal

The goal of this session is to start formalizing the plan for your workshop and engage in conversations with the team and peers.

2. Learning Objectives

- Review the design constraints
- Confirm the resources we offer
- Engage in next steps in planning
- Begin building your RDI teams
- Consider the admissions process
- Outline the schedule for the workshop
- Identify what you need from the RDI project team

3. Admissions Process

Which students do you want to attend? Why those students?

Will attendance be required or optional? Why?

What information might you want in an “application”?

4. Setting a Schedule

Session VII: Choosing A Change Model To Build Your Plan Around

Session Overview

Goal

The goal of this session is to discuss how the RDI could be a positive step to cultural change at your institution, and having a discussion about emergent models for change.

Introduction

- *I do not believe a change process is simple.*
- I do not believe you can formulate a perfect plan for change that needs no adaptations in real time.
- I do not believe one change model works in all situations.

I do believe change is more like growing a garden than tuning a machine. While you do not have control over all the nuances affecting the garden (e.g., how and when every seed will emerge, what insects or rainfall comes your way, or the tastes of all who will eat from your garden), you still should have a planned layout for planting and nurturing the garden. This plan should be based on your capabilities and understanding of where your garden is, and the growth, as well as the investments, you want for this garden.

Therefore, I present 5 models to help you form a plan for your team. You can choose different models for different audiences, or hybrids, as best suited to your organization and change.

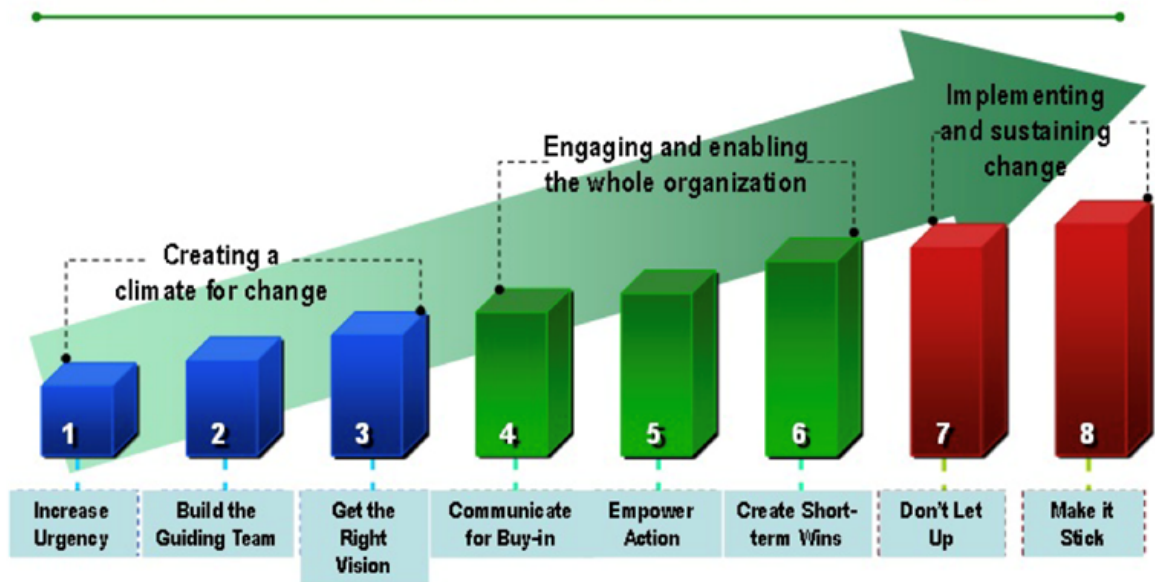
Change Models

1. Debra Meyerson's "Tempered Radicals"



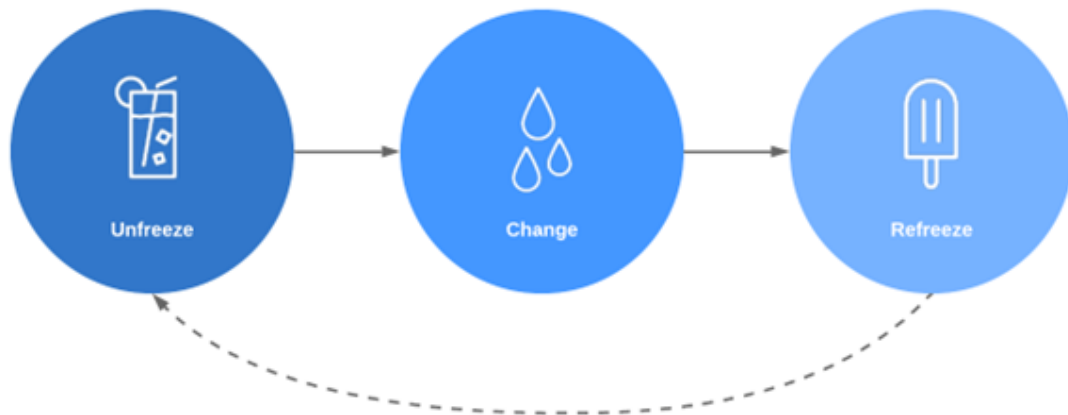
Fig. extracted from <https://www.slideshare.net/SunnyMervyneBaa/radical-change-the-quiet-way>

2. John Kotter's "Eight Steps of Change"



■ Kotter, John P. and Cohen, Dan S. The Heart of Change. Boston: Harvard Business School Press

3. Kurt Lewin's "Change State before Change"



Made in
Lucidchart

4. Satir's "Psychological Pain Motivating Change"

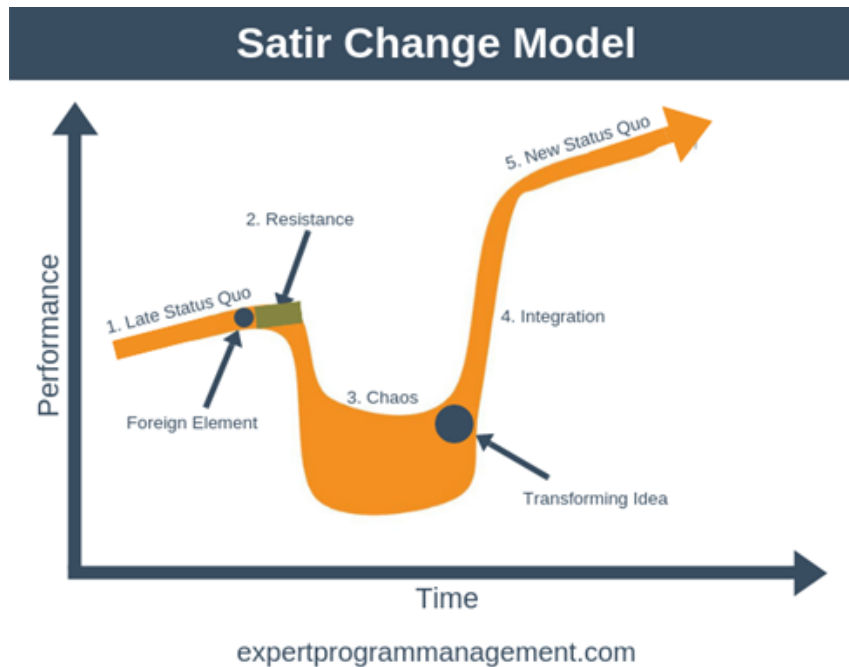


Fig Extracted from <https://expertprogrammanagement.com/2018/10/satir-change-model/>

5. Richard Thaler and Cass Sunstein's "Nudge Change Model"



Fig. extracted from <https://i0.wp.com/www.process.st/wp-content/uploads/2020/06/8-Critical-Change-Management-Models-to-Evolve-and-Survive-29.png>

Additional Resources

1. Success Groups Facilitation Guide

The goal of the success groups is to directly connect participants with other participants of similar backgrounds in a small group setting moderated by a key faculty or college contact (group leader) who will be with them throughout the first year. The success group is not an additional workshop but a place where students can bring their issues/ideas/questions and share them with a smaller group of people. These groups are meant to be safe spaces; what is said in the group remains only between the group and the research team. Please make sure members know this on the first day of the group meeting. We assigned our success group students to groups based on their backgrounds, but we recommend you consider having diverse groups of students and minimize overlap of students in the same department such as to provide a safe space for open conversation. The conversation in the group does not have to focus strictly on any particular topic, but rather any students' doubts relating to the Institute's overall goals and sessions as well as other aspects salient to their transition into the doctorate. Success group leaders will:

- Help students reflect on the information obtained from the different workshops and help them find ways to apply it to their individual doctoral paths.
- Develop camaraderie, trust, and the foundations of a self-sustaining group.
- Extract the overall lessons learned from any one discussion and ensure students leave each day with clarity about the topics discussed.
- Point students to appropriate resources, if necessary, beyond those provided in the Institute.
- Be a point of contact to their students throughout the first year of the doctorate for support.

We structured our success groups in groups of 6-8 participants including the facilitator. We held on success group meeting every day during the RDI to develop camaraderie and followed up the conversation with approximately monthly meetings throughout the students' first year in the doctorate. We describe our conversation prompts for each of the meetings in the following sections.

Success Groups during the RDI.

The goal of the success groups during the week of the RDI is to have an open space to ask questions, discuss the lessons learned during the RDI, and create camaraderie. This camaraderie will allow for more authentic data collection in the monthly meetings that will take place throughout the students' first year of doctoral study. The critical data that we would like to capture in these sessions that will take place during the RDI is corrections on preconceptions relating to graduate school and research. For example, if a student says, 'I used to think X was true but today I learned Y is true' this is the type of comment we would want to dig into deeper. In addition to specific questions, we want to have them discuss each day, the following questions will help facilitate conversations every day:

- Highlight some key things you learned.
- What (if anything) surprised you about what you heard?
- Did you believe something different?
- From where had you learned that prior belief?
- How do you plan to put this new knowledge into practice?
- Do you have any questions about today's topics you would like to clarify?

Below is a table with our success group guiding questions matching our workshop topic areas for the RDI:

Topic Area	Success Group Questions
Doctoral Program Management	➤ In the process of deciding to begin graduate school, did anyone help you make that decision? How? ➤ Before attending the RDI, what was your plan to approach your doctoral education? (By approach, we mean philosophy, advice they plan to implement, or ideas regarding the managing of graduate school). ➤ Who in your life helped you develop this approach? ➤ What information did you consider before accepting a financial offer? ➤ Who are you thinking will be the members of your team in graduate school?
Advising and Interpersonal Relationships in Grad School	➤ What do you know about how your advisor works? ➤ When you were choosing your advisor, what did you really consider? What did you miss considering? ➤ What are your plans to make sure you have a proper communication system with them? ➤ What 'unwritten rules' did you learn today that will help you moving forward?

Day to Day strategies for grad school success	➤ How familiar are you with primary literature? ➤ How will you hold yourself accountable for engaging with it from day one? ➤ How confident are you about your time management skills? ➤ Relating to what you learned today, what will you put into practice as you manage your time in graduate school?
Being minoritized in Grad School	➤ Share some strategies you believe will help you succeed as a minoritized doctoral student. ➤ Knowing the risks grad school can pose to grad student mental health, what are some proactive actions you will start taking today? ➤ What expectations can we have for each other as a group moving forward throughout the year?
Life post PhD	➤ What are your long-term plans post PhD? ➤ What activities do you think you will need to engage in to achieve this? ➤ Did today make you consider any other career options?

Final questions for wrapping up the RDI week: “This week, you have all shared strategies and actions you plan to put into place. Take a moment to set some intentions for the academic year individually and think about how you plan to leverage each other as a success group from today forward. Share as you these intentions as you feel comfortable and discuss how you could leverage each other”.

Monthly Success Groups after the RDI.

The main goal of these monthly meetings is to help students translate the knowledge of the RDI to their real-world graduate school experience. Although initially we recommend you provide more scaffolding in the conversation, every month we want to shift towards getting them to rely on each other more for answers and develop intra-group relationships that persist in the long term. The goal of these questions for the first meeting is to set up a baseline that helps you familiarize yourself as facilitators with each student’s environment and initial impressions. You may use these questions for future meetings but these will help recap those first weeks on campus.

- You've just completed your first few weeks of grad school. How have things been going?
 - Was there anything you expected that you did not receive or that did not meet your expectations?
 - What has been easy about this transition?
 - What has been difficult about this transition?
- Has your institution met your expectations? Why or why not?
 - This question aims at the broader climate of the school/town they chose instead of the department/college level interactions. Many of them described being geographically intentional regarding where they applied to minimize the possibility of racism.
- What support systems have you identified as useful already? Have you identified any that might be helpful in the future?
- What successes/challenges are they having with time management?
 - How are you currently balancing courses and assistantship duties?
- Beyond orientation, what support has the university (at any level- Program, Dept, College, University, etc.) provided for you? Have you connected/been connected with any minority groups or other graduate student groups so far?
- Has anything from the RDI been exceptionally helpful as you have started school?
- What questions do you have for me? What questions do you have for others? Have you learned or experienced anything that you really want your peers to hear about?

The following questions could also be used in the first meeting but may be more applicable for subsequent follow ups. As the relationships develop, the goal is for students to guide the conversation towards what is salient for them at that moment in time. However, here are questions to nudge those salient aspects:

- How have things gone since we last met?
 - What was easy or exciting this past month?
 - What was difficult this past month?
- What is motivating towards finishing your PhD right now?
- What support systems do you have and how are you engaging them?
- How is your advising relationship going?
- How are you building your plan of study and selecting courses?
- What goals have you set for yourself and how are you holding yourself accountable to them?
- Are you connecting with your family? How are those relationships handling your transition?
- How are you approaching selecting your research topic at this time?
- Think back to the workshops you attended during the RDI. Which of these topics/lessons learned has been the most salient to you these past weeks?
- Do you feel like you belong? Why or why not?

- Literature has shown that URM have a different experience in the PhD. Has that been your experience so far? Why or why not?
- Has anything occurred in the past month that has not been discussed but you would like to share more about?
- What questions do you have for others? Have you learned or experienced anything that you really want your peers to hear about?

2. List of Vetted Workshop Facilitators

Name	Email	Institution	Position
Dr. Howard Adams	hgadamsasso@cox.net	HG Adams and Associates	President
Dr. Sharnnia Artis	sartis4@gmu.edu	George Mason	Vice President for Diversity, Equity and Inclusion
Dr. Ella Ingram	ingram@rose-hulman.edu	Rose Hulman	Associate Dean for Professional Development and Professor of Biology
Dr. Javier Kypuros	jkypuros@uttyler.edu	University of Texas, Tyler	Dean of Engineering
Dr. Jeremi London	jslondon@vt.edu	Virginia Tech	Associate Professor, Engineering Education
Dr. Susan Lord	slord@sandiego.edu	University of San Diego	Chair and Professor, Integrated Engineering
Dr. Morgan McCain	morgan@mccainpsychologicalservices.com	McCain Psychological Services	Founder
Dr. Homero Murzi	hmurzi@vt.edu	Virginia Tech	Assistant Professor, Engineering Education
Dr. Marquita Qualls	mqualls@entropiaconsulting.com	Entropy Consulting	Founder and Principal
Dr. Mayra Artilles	mayra.artiles@asu.edu	Arizona State	Assistant Professor

		University	Engineering Education
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Dr. Juan Cruz	cruzj@rowan.edu	Rowan University	Assistant Professor Engineering Education



Research has shown that underrepresented minorities (African American, Native American, Pacific Island and Hispanic American) are finishing the doctorate in engineering in lesser rates than their majority peers (Council of Graduate Schools, 2007). For every seven doctorates in engineering granted to majority students, only one minority will obtain one (National Science Foundation, 2019). To address this problem, we developed the Rising Doctoral Institute (RDI) which aims to provide a timely and preparatory experience for rising doctoral students in engineering to address issues related to transitioning into the Ph.D. encountered by underrepresented students. However, we understand that a single intervention will not change the landscape of URM PhD students. For this reason, our proposed project aims to develop a research-based intervention model of this preparatory experience and work directly with institutional partners to develop and adapt this model for local contexts.

The goals of the RDI are to

- (1) Examine the effect of early interventions for doctoral students on the transition into the engineering doctorate, and*
- (2) develop sustainable models for institutions to implement on their campus to help URM students' transition into the doctorate.*

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