Experiences from UMN’s CogniSense NRT: overview and advice

Victoria Interrante
Professor, Computer Science and Engineering
Director, Center for Cognitive Sciences
University of Minnesota
Overview of Our NRT

• Program goal:
  To provide graduate students with the skills and opportunities required to successfully pursue research-related careers in translational cognitive and sensory science, with a particular emphasis on informing the development of assistive technologies for people with sensory deficits: low vision, hearing loss, sensorimotor impairment
Overview of Our NRT

• Involved colleges and departments:
  - College of Science and Engineering: Computer Science, BioMedical Engineering
  - College of Liberal Arts: Psychology, Speech/Language/Hearing Sciences, Cognitive Science
  - College of Education and Human Development: Kinesiology
  - Medical School: Neuroscience
  - College of Design: Human Factors
  - College of Biological Sciences: Ecology, Evolution, and Behavior
Overview of Our NRT

• Management structure:
  Our NRT is jointly administered by two Centers:
  Center for Cognitive Sciences (under the Provost’s Office)
  Center for Applied and Translational Sensory Sciences
  (under the Office for the Vice President of Research)
Administratively, we are under the Provost.
Overview of Our NRT

• Trainees: numbers and recruitment methodology

  Funded trainees (full fellowship+tuition/health): 8 per year – 6 funded by our NRT and 2 funded by a matching grant from our Graduate School. The matching grant is targeted at students from underrepresented groups: vision or hearing loss, women in science, underrepresented ethnicities.

  Unfunded trainees (eligible to apply for travel and mini-grants): 16 different individuals so far

  Fellowship support is provided to students in years 2 and/or 3 of their PhD
Overview of Our NRT

• Trainees: recruitment methodology

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Advantages: during year 1, while they are mainly focusing on taking classes, students have the opportunity to become familiar with our program and to decide if they think it is a good fit for their interests (we also have the opportunity to observe students’ engagement and gauge their interest ourselves). This has helped us to form an exceptionally strong cohort of funded trainees who are deeply invested in the program and it helps to establish our expectations of active trainee participation independent of fellowship support, which is important for years 4 and 5.
Overview of Our NRT

• Trainees: recruitment methodology

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  **Disadvantages:** it’s harder for us to use the promise of an NRT fellowship to recruit students to the University of Minnesota. This is particularly relevant when it comes to our goals of broadening participation. We have to attract incoming students from diverse backgrounds independently of guaranteed NRT support.

  In many cases, potential students from under-served populations may not necessarily be thinking about a PhD. Targeting recruitment at the MS level would be a promising alternative.
Overview of Our NRT

• Key elements of our program

  1. **Education**: new graduate minor in Translational Sensory Science, with two required courses and multiple electives:
     • GCC 5022: The Human Experience of Sensory Loss: seeking equitable and effective solutions
     • CGSC 8410: Seminar in Learning, Perception and Cognition
  2. **Research**: each trainee must identify a co-mentor from a different discipline (at the time of application), and trainees are expected to do a one-semester research rotation in their co-mentor’s lab. Examples include:
     • Exploring habit-learning to address deficits in executive function using virtual reality technology (psychology + computer science)
     • Equalizing access to virtual reality technology through strategies to mitigate cybersickness (kinesiology + computer science)
Overview of Our NRT

• Key elements of our program
  2. **Research**: (more examples)
    • Developing an intelligent personal assistant for smart home technology for use by people with cognitive or sensory deficits (computer science + psychology)
    • Developing novel ultrasound-based hearing aid technology (biomedical engineering + speech/language/hearing sciences; biomedical engineering + neuroscience + psychology)
    • Understanding mechanisms of motor symptoms in people with Parkinson’s disease (neuroscience + kinesiology)
    • Understanding the cognitive processes influencing speech perception in cochlear implant users (psychology + speech/lang./hearing sci.)
    • Investigating interactions in age-related hearing and vision loss (speech/language/hearing sciences + psychology)
Overview of Our NRT

• Key elements of our program
  3. Professional Development
    • Internships: 3M, Cohlear Corp, Facebook, GN ReSound, Smiths Medical, Oticon (Denmark), Envoy Medical
    • Workshops/Symposia (2x/year): grant-writing, science communication, etc.
    • Brown Bag discussions (3x/month): sharing internship experiences; creating an IDP; career–related Q&A with visitors from industry, postdocs, junior faculty; community perspectives from people living with sensory loss; citation management; data visualization; using twitter for professional networking; three minute thesis preparation
Overview of Our NRT

• Key elements of our program
  3. **Professional Development** (continued)
     • Student-organized Spring Research Day symposium
     • Travel grants (open to non-funded members of the cohort)
     • Mini-grants (open to non-funded members of the cohort)
  4. **Outreach**
     • Monthly “journal club” with residents of the Abiitan Mill City retirement community
     • Science communication podcasts
     • Sensory Loss Symposium
     • Panel on “Living with Sensory Loss”
Overview of Our NRT

• Key elements of our program

5. Evaluation

• Data collection: participation metrics, event surveys, bi-annual questionnaires

• Focus groups (facilitated by the UMN Center for Applied Research and Educational Improvement)

• Controlled comparisons with non-trainee cohorts
Fundamental Advice

• Make sure that you are applying for the right reasons
  • You have a vision for a new interdisciplinary graduate program that you want to see realized or a new approach to graduate education that you want to explore
  • You have a strong support network and multiple collaborators who are committed to working with you to bring the program to fruition
Fundamental Advice

• **Wrong reasons to apply for an NRT**
  • You think it will help you get tenure/promotion
    [it’s not about you, it’s about you doing something for the greater good]
  • Your department head / dean / university administrator rewards bringing in big grants
    [it’s not about the money; it’s a five-year commitment to building a program that will live on after NSF funding ends]
  • You think it sounds like a great way to get funding for multiple of your PhD advisees
    [it’s not a research grant (of the kind we are used to)]
Fundamental Advice

• Your program should be student-focused. Ideally, it should be student-driven.
  • We ask our trainees what they are interested in and we define our program elements accordingly
  • Our students assume tremendous responsibility and feel strong ownership over our program
  • We make it clear up front that the NRT is not a typical fellowship (e.g. free money, no strings attached); when students join, they are committing to becoming active members of a cohort for the entire duration of their PhD
Practical Advice

• Make expectations clear upfront
  • Faculty need to know when they agree to be on the grant what will be expected of them. We try to keep the burden light for most.
  • Students need to know when they agree to join the program what will be expected of them. We use signed offer letters.
Practical Advice

• Plan to hire a full time staff to help you run your program
  • Our NRT has two half-time staff: a 50% project coordinator and a 50% administrative assistant

• Plan to hire a professional external evaluator
  • You can find many excellent evaluators with NSF project evaluation experience; they don’t need to be local
  • Evaluation is expensive – make sure you budget appropriately!
Practical Advice

• Don’t try to do it alone
  • Our project leadership team (2 center directors, project coordinator, administrative assistant) meets 3-4 x / month
    • once with a finance specialist (helping us to keep track of how our funds are being spent and to make sure that our expenditures are being processed correctly);
    • once with our internal evaluator (to keep her in the loop about our program activities and make progress on our evaluation plans)
    • we also use these meetings to plan our activities and events
  • Leverage relevant resources at your institution
Advice from the reviewing perspective

• The NRT is not a traditional research grant. The focus of the research is on developing new models for improved graduate education.

• Your program elements need to be informed by research (evidence-based). For each activity, you need to have a clear understanding of:
  • What are the student development objectives?
  • How will the activity attempt to address these objectives?
  • Afterwards: you need to assess not just participation numbers or student satisfaction but: how well did the activity succeed in addressing the objectives?
  • Aim to generate knowledge that others can use
Advice from the reviewing perspective

• Pay attention to broadening participation. If you decide to partner with a MSI it needs to be a real partnership.

• In the second round, panelists will not be experts in your research area; be sure that the impact of your program is clear.

• Panels will have representation from: previous PIs, professional evaluators, university administrators, folks from industry, representatives from a wide variety of educational institutions. Make sure your proposal is speaking to everyone.