The Challenge of Returning: Transitioning from an Engineering Career to Graduate School

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Abstract

While many graduate students have progressed directly from their undergraduate education to graduate school with little or no time passing in between the two, other graduate students have not followed this pathway. Because of these experiences, "returning" students are different in many ways from "direct-pathway" students, and these differences can enrich the graduate experience both for the returning students and for their fellow students. However, these returning students also face certain challenges that direct-pathway students do not. There are many unanswered questions, particularly in regard to returning students in engineering and other STEM fields. This study addresses some of these questions.

Purpose and Methodology

Graduate students who fit the profile described above were asked to participate in an interview covering three main areas:

- Preparations to return to school
- Perceived similarities and differences, compared to direct-pathway graduate students
- Obstacles to success and resources used to overcome those obstacles

The interview data was then analyzed, using a constant comparative method, to find themes for each student and among the study population. Thus far, three interviews have been completed and analyzed. Additional interviews are being carried out, analyzed, and planned.
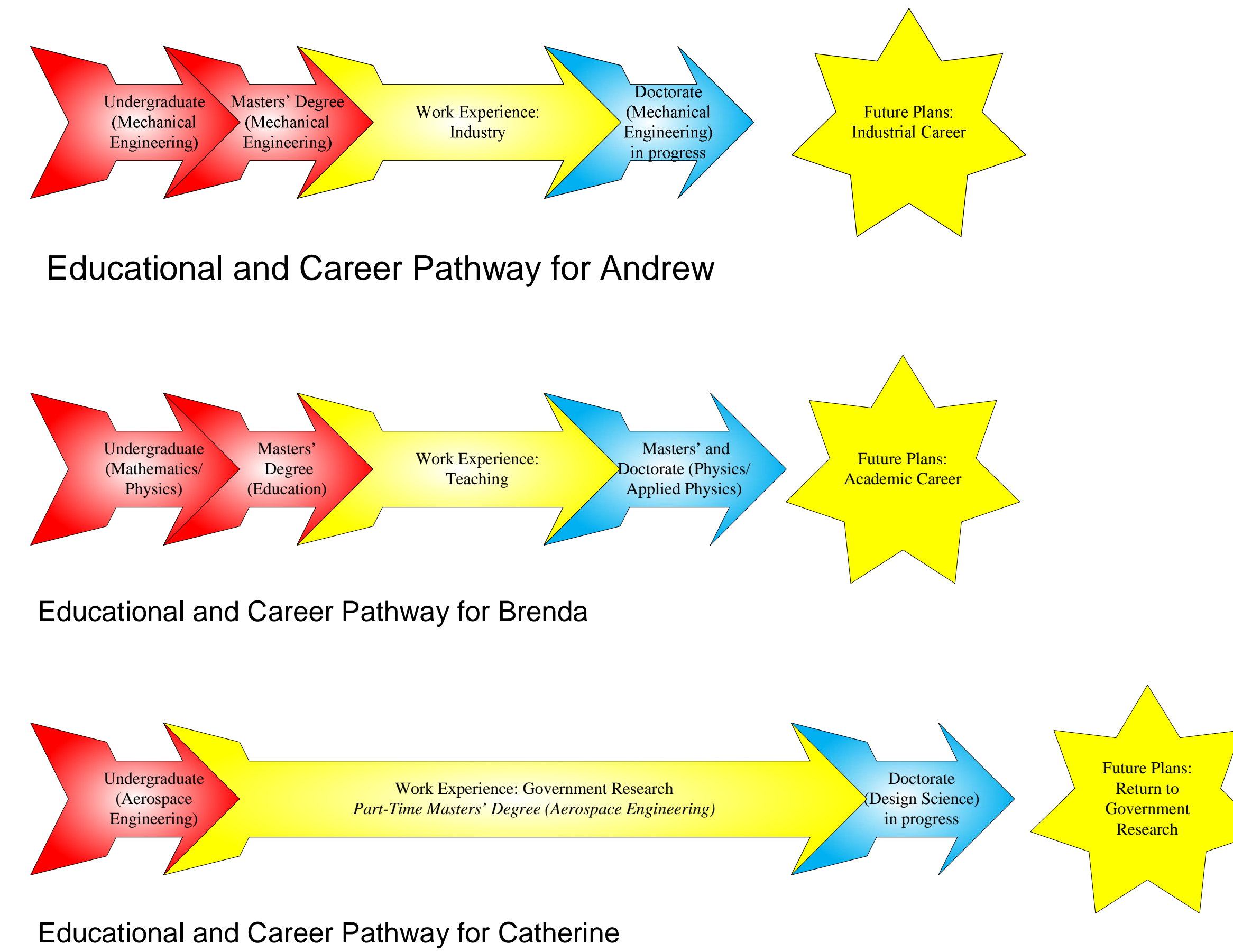
Research Questions

- How do returning students experience graduate school?
- What factors hinder or facilitate the success of returning students in graduate school?
- What similarities and differences do returning students perceive between themselves and direct-pathway students?
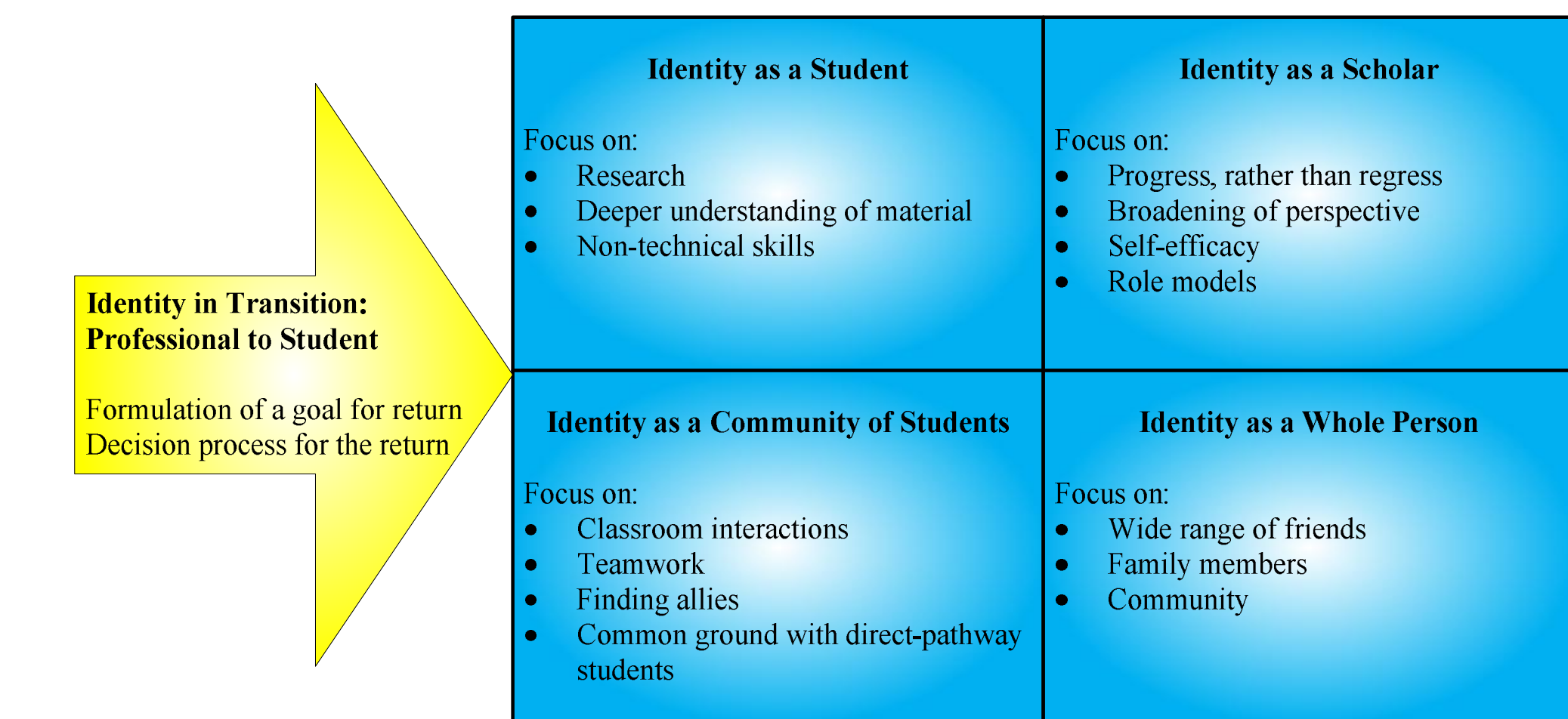
Participants

Pseudonym	Gender	Age	Years in workforce	Current Status
Andrew	Male	33	7	Third year Ph.D. student
Brenda	Female	38	5	Post-doctoral Researcher
Catherine	Female	41	18	First year Ph.D. student

Diverse Paths to and Through Graduate Education

Educational and Career Pathway for Andrew

Undergraduate (Mechanical Engineering) → Masters' Degree (Mechanical Engineering) → Work Experience: Industry → Doctorate (Mechanical Engineering) in progress → Future Plans: Industrial Career

Educational and Career Pathway for Brenda

Undergraduate (Mathematics/Physics) → Masters' Degree (Education) → Work Experience: Teaching → Masters' and Doctorate (Physics/Applied Physics) → Future Plans: Academic Career

Educational and Career Pathway for Catherine

Undergraduate (Aerospace Engineering) → Work Experience: Government Research, Part-Time Masters' Degree (Aerospace Engineering) → Doctorate (Design Science) in progress → Future Plans: Return to Government Research

Themes as Aspects of Identity

Identity in Transition: Professional to Student
- Formulation of a goal for return
- Decision process for the return

Identity as a Student — Focus on: Research; Deeper understanding of material; Non-technical skills

Identity as a Scholar — Focus on: Progress, rather than regress; Broadening of perspective; Self-efficacy; Role models

Identity as a Community of Students — Focus on: Classroom interactions; Teamwork; Finding allies; Common ground with direct-pathway students

Identity as a Whole Person — Focus on: Wide range of friends; Family members; Community

Future Work

- Interviews with more returning students (in process)
- Demographic study on gender, ethnicity, and age of the returning student population in STEM
- Design of programs to assist students in preparing for successful return

Research Findings: Common Themes

- **Definite Goal For Graduate Education**
  - All participants had some definite goal, though goals were different
  - Goal contributed to a feeling of engagement with the program and increased focus
- **People-Focused Decision Process**
  - All participants focused on talking to people
  - Choosing the advisor as much as, or more than, the program
- **Significance of Research**
  - All participants saw their research as being important, not just a means to get the degree
- **Challenges with Group Projects**
  - Direct-pathway students may have a different outlook and different priorities
  - Constraints on where/when students who are parents are able to work with groups
- **Common Ground with Direct-Pathway Students**
  - All participants found common ground in the intellectual content of being a student
- **Life Outside of School**
  - More friends outside of the university
  - Student parents have significant commitments outside of school

Example Data Excerpts

I wanted to bring something… that I did not believe there was sufficient expertise in. So I went looking for a way to broaden as opposed to narrow my perspectives, and bringing a new perspective in…my motivation was more to learn something new, to expand my horizons and to grow personally, and if that opened doors professionally, that was icing on the cake.

I asked questions about who these people were. And one of my decisions was, who are these advisors? How do they treat their students? Are they – do they respectfully engage them, and can I grow with this person, can I work with this person?

I spent a lot of work researching, like doing reading on my research topic that I wanted to research, because that was what was important to me, it wasn't, you know, taking more classes and things like that, it was the research.

The strange, maybe, disadvantage that I noticed, but it depends on how you look at it, was that I found I had a harder time doing group projects, because I felt like the students that I was working with tend to be immature… but then myself I had to realize that for me it was harder because I was used to signing my name to work and that I had done and really worrying about the quality of it because it was, you know, something that was going to be implemented…

I think in general the commonality is the overall enthusiasm for doing things that most of the world thinks is boring. That's a good commonality… most people go into it because they're interested in it… most people have some sort of spark of inspiration, and so that – especially if you can focus discussions around the spark of – of inspiration then you can find a lot in common with young people because young people often are very easily inspired, and they will spend a lot of time on research projects that they're inspired by.

[I]t is all about my family, and helping them and helping us grow together and be healthy, and the community and the church and the broader society overall. Very different perspective… I'm much more mature, I'm much more concerned about what's happening around me, not just what's happening with me.