Post-Program Completion Patterns of Cohort Participants

AIMS^2 (HSI-STEM Grant) Meeting

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Overview

- Background: Exploring relationship between project participation, program completion, and career/educational patterns

- Design and procedures: Structuring the investigation to understand relationships

- Results and interpretation: Interpreting patterns in cohort participant experiences and outcomes

Context

- [Science] is more than a school subject, or the periodic table, or the properties of waves. It is an approach to the world, a critical way to understand and explore and engage with the world, and then have the capacity to change that world..."

  President Barack Obama, March 23, 2015

Background

- One of the most important resource for students is faculty (Cotton and Wilson, 2006).

- Students successful in knowing even one faculty member closely are likely to feel more satisfied with their college life and aspire to go further in their careers (Rosenthal et al., 2000).

- Faculty members taking an interest in their students' academic progress could potentially make significant contributions in increasing their intellectual and professional development (Anaya & Cole, 2001).

Purpose

- This case study explored the relationship between AIMS^2 cohort graduates and career development

- Focus of the study was on key project experiences with student-faculty interaction, peer-peer interaction, and faculty research
  - Examine how interactions shaped students' experiences as project cohort participants and students' post-program completion experiences in the workforce or graduate school

- **Data Sources, Sampling, and Selection**
  - A mix of criterion and network sampling strategies
    - 25 Students: representing all engineering and computer science disciplines within the AIMS^2 program

- **Sample**
  - Personal interview with twenty-five AIMS^2 program graduates
    - Sample: Cohorts 1-3: 11 females and 14 males graduates
    - Sample distribution by major/gender = next slide

- **Data Collection and Analysis Procedures**
  - **Semi-structured personal telephone interview protocol**: with 25 graduates of the AIMS^2 program
  - **Thematic data analysis**: organized codes and themes by using *ATLAS.ti* to segment, code, and group codes into families as thematic patterns emerge

Demographics: Major and Gender

- **Major**
  - 6 Civil Engineering, 3 Construction Management, 4 Mechanical Engineering, 4 Electrical Engineering, and 1 Manufacturing Systems Engineering, 7 Computer Science

- *Gender*
  - *Civil Engineering (CE) = 5 males, 1 female*
  - *Construction Management (CM) = 2 males, 1 female*
  - *Mechanical Engineering (ME) = 2 males, 2 females*
  - *Electrical Engineering(ECE) = 1 male, 3 females*
  - *Manufacturing Systems Engineering (MSE) = 0 males, 1 female*
  - *Computer Science(CS) = 4 males, 3 females*

General Employment Outcomes

Employment Status

- *24 of 25 students employed on a full-time (FT) basis—and no students are employed PT.*
  - One student attends graduate school FT and is NOT employed..
- Students who are employed tend to work in fields that are closely aligned with their major fields of study
- Most students who are employed work at sites in California
- *Types of employers vary widely:*
  - *Public control: city and county agencies*
  - *Private sector: engineering firms, healthcare systems, computer firms, manufacturing firm, and one reported being employed at a consulting group.*

Employment Outcomes: Titles

CE	CM	*ME*	*ECE*	*MSE*	CS
Ass't Civil Engineer	Ass't Facilities Coordinator	Thermal Engineer	Jr. Electrical Engineer	Manufacturer's Assistant	Software Tester
County Civil Engineer	Ass't Director Construction Management Project	Mechanical Engineering Ass't	Digital Electrical Engineer		Applications Dept
Civil Engineer (2)	Ass't Project Manager	Opto-Mechanical Engineering Tech	Ass't Electrical Engineer in Municipal Controls		Quality Performance Engineer
Engineering Manager		Sales Engineer	Electrical Inspector		Software Engineer (2)
Ass't Engineering Structural Tech					Software Developer (2)

Employment Outcomes:Women

Employment Status: 11 females interviewed. 10 are working FT.

Major	Job Title	Industry
CE	Ass't Civil Engineer	Private Consulting Group
MSE	Manufacturer's Ass't	Private Manufacturing Group
CM	Ass't Facilities Coordinator	Public Sector
ME	Thermal Engineer	Private Sector
ME	Mechanical Engineer Ass't	Private Sector
CS	Software Tester	Private Sector
CS	In city's Application Dept.	Public Sector
ECE	Jr. Electrical Engineer	Private Sector
ECE	Electrical Engineer	Digital Co-op in Private Sector
ECE	Ass't in Municipal Controls	Public Sector

Graduate School Students: Characteristics and Experiences

Graduate School Status

- *2 students attending FT, 5 attending PT*

Students Reported:

➢ *"I'm in a Masters' program and I am almost finished…waiting to hear on my doc program application…"*-**Linda**

➢ *"I am in grad school now for engineering…I am starting to apply to doc programs now…I want to keep on going…"* –**Mary**

➢ *"I like my Masters' program…different than AIMS2 but I am thinking about going for a doctorate…"* –**Paco**

➢ *" Since my job helps to pay for my grad school I decided to take the opportunity…so far it's good…I guess…I just want to be done but it will raise my pay…"* –**Alfredo**

➢ *" I don't like that I have to go to grad school part-time but I have to work…maybe I can get more money when I am finished…"* –**Marilyn**

➢ *" I go to grad school part-time…it's ok…I feel like it's going to take me longer…but I like my job and I wouldn't quit it to go full time."*- **Scott**

Graduate School Aspirations

Student Aspirations

- 10 students "thinking about grad school/taking GRE prep courses" and 8 students who reported being unsure about graduate school at this time

Students Reported:

➢ *"I like working, but I am thinking about doing my MBA…soon"* –**Sam**

➢ *"I'm going to continue working my way up in my company first…being a female…let my company pay for grad school…"*-**Karen**

➢ *"I like my job…I like working…I'm sure my job would pay for grad school…I would like to work on my MPA…just not now…"* –**Eric**

➢ *"No plans for doc program…maybe in 5-10 years…I already have my Masters' so I am in no hurry."* –**Janice**

Results: Meaningful Relationships

Student-Faculty Mentoring Relationships and Research Contact Facilitated

- "The research was great…I got to develop an app."-**Paco**
- " We developed a lab in materials testing. I really liked that and it has helped me with my job now"**-Alfredo**
- "I wasn't too involved…wanted to be…but I was a little involved with a water pipeline project."-**Holly**
- "My advisor was very involved with my research and it helped me to learn a lot of stuff for my job now.- **Betty**
- "I got involved with the clubs on campus because of one of my professors."-**Kim**
- " Hard to keep up with my advisor because of the changes …but when I got somebody I could talk to…it was great because I stayed more on track." **Larry**

Results: Mentoring and Research Participation in AIMS²

***Faculty Commitment, Caring, Mentoring, and Advising
AIMS² Translated to Post-Program Completion Success***

- "I needed that weekly check-in with our workshops…yeah that part really helped me"-**Eric**

- "Advising was very sporadic…we had a different professor every two months…but what advising I had helped me to forecast next courses to take."-**Mark**

- "I didn't need much advising but my advisor was great…I attended a lot of conferences and had opportunities because of their attention to me." **Karen**

Results: Research Experiences and Career Development

The Effects of a Research Culture on Career Development and Post-Graduate Experiences

- "I loved the mock-interviews and the cover letter talks…these helped me the most"-**Mary**

- "…AIMS2 is team oriented and this prepared me for my job…it was like having guidance for my future"-**Janice**

- "**…**getting out talking to people...using teamwork in our research because that is helping me in my job now."-**Robbie**

Results: Career Decisions

Career Decisions and Experiences Shaped by Faculty Mentors in the AIMS² Project

- "Because of AIMS² I feel it has shaped my career, got me a job and I now help out with other students in AIMS2-not really thinking about grad school but may go to CSUN for grad school"-**Susan**

- " …because of the research I did with my advisor helped me and influenced my career and job"-**Chris**

Results: Peer-Peer Interaction and Networking

Interactions between Students and Faculty in Orientations and Socials Enhanced Alumni Networking Connections

- " I wasn't very social before I came to the AIMS2 program…it taught me how to talk to others"-**Sam**

- "The events were cool…got to see other projects and meet new students."-**Betty**

- "I have been in touch with other cohort members but not CSUN's alumni association…didn't know about it"-**Linda**

- "I do socialize with a few close friends from my cohort…I have used the alumni association for job postings and info"-**Jesus**

- "I went to an alumni BBQ and that's how I got my job."- **Wendy**

Results: Graduate Education Directions

Post-Graduate Education/Terminal Degrees were Fostered by the AIMS^2 Program and Student-Faculty Relationships

- "My advisor helped me to decide on graduate school programs-taking GRE prep now."-**Larry**

- "I am in my grad program because of my advisor and the internships I was able to get while in AIMS^2"-**Marilyn**

- "I am in the CSUN Masters program in (redacted) and my decision to do this was based on my experiences in AIMS^2…I wanted to stay where I felt comfortable." **Scott**

Results: Life Lessons

AIMS² Program Faculty and Peers Facilitated Life Lessons Among Graduates

- "I remember a quote from my advisor-Plan everything- stay focused set and attain your goals."-**Kim**

- "Utilize teamwork with your projects."-**John**

- "Confidence level increased and I learned how to get the right answers from the right people."- **Jack**

Summary and Recommendations

Summary

- Students reported that their face-to-face contacts with faculty mentors were the most effective form of communication

- Weekly meetings generated strong relationships with their faculty mentor

Recommendations

- Continue and expand AIMS^2 research activities but increase opportunities for conference participations and professional development/career-related activities

- Develop and use individual AIMS^2 career plans that include academic progress, career aspirations, internship interests, conference participation, and summer research participation