

“Getting an internship...I’m still trying to find that:” Asian American Student Experiences Obtaining Engineering Internships

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Abstract: Internships can provide engineering students with financial support, practical experience, and motivation to complete degrees. The qualities employers seek in interns go beyond high grade point averages to include participation in campus organizations and technical societies, as well as leadership skills. Whether Asian and Asian-American (ASAM) students are aware of the importance of internships and the experiences they should seek to obtain internships is an interesting question. In the first year of a three year longitudinal ethnographic study to determine the factors that contribute to differential success among students from racial and ethnic minorities, we performed one to two hour semi-structured interviews of eighty ethnic and racial minority students in the College of Engineering at the University of Oklahoma. Participants were surveyed to obtain factual information related to their background and college experience. Twenty-one participants were ASAM. ASAM participants who had been offered internships in engineering or an undergraduate research assistantship had participated in technical societies related to their major or were heavily involved in campus activities. ASAM participants who applied for an internship, but were not offered one, had not participated in a technical society related to their major. Participants who had not applied for internships were not active in technical societies. Participation in the Asian American Student Association (AASA) does not help participants obtain an internship in the same way that participation in a technical society does. Our College has no Asian specific technical society, although we do have technical societies for other racial and ethnic minorities. None of the participants interviewed had a leadership role in any technical society, on-campus student organization or in AASA. Many of our ASAM participants are not seeking the campus experiences that will support the next phase in their career development, leading us to conclude that some ASAM students lack cultural capital.

Keywords: Asian-American, engineering, internships, cultural capital, technical societies.

Introduction

Engineering has been a field that has traditionally attracted relatively large numbers of Asian and Asian-American (ASAM) students in the United States (U.S.) (National Science Foundation, 2003). The high mathematical and scientific prerequisites in engineering

disciplines that seem to be obstacles to other members of racial and ethnic minorities have not impaired the ability of ASAM students to achieve success in these challenging disciplines.

ASAM students are not considered to be members of an under-represented minority in engineering disciplines, unlike Native American, African American, and Hispanic students. This separation between minority and Under-Represented Minority (URM) is made by the National Science Foundation (NSF) (2003) that funds scientific research in the United States. It has meant that scholarships and opportunities that are offered to members of other minority groups on the basis of their URM status are often closed to ASAM students. For example, many URM groups have technical societies that are dedicated to helping members of their racial or ethnic group network and achieve professional success. The National Society of Black Engineers (NSBE) is an example of one such organization (<http://www.nsbe.org/>). ASAM students have no such organization, either at the University of Oklahoma, or nationally.

For the purposes of this study, an internship is defined to be paid work within the discipline which is directly beneficial to the participant's career. This category therefore includes cooperative arrangements, where students alternate semesters working and in school, and undergraduate research assistantships. Internships provide engineering students with opportunities to practice and expand their professional knowledge, to reinforce student identification and confidence as an engineer, to build a network of professional contacts, and to obtain job placement after college. Receiving an internship placement is an important milestone in many engineering professional careers.

Engineering students generally learn about internship opportunities from engineers in their circle of family or friends, professors, university-based career services or placement offices, and technical societies. Employers often seek more than high grade point averages (GPA) from internship applicants, just as they do from full time permanent employers. Employers typically look at leadership experiences and participation in campus organizations and technical societies in determining the best candidates.

The Research Institute for STEM Education (RISE) began investigating the educational trajectory of successful ASAM students when the NSF Directorate of Undergraduate Education funded our grant entitled "Portraying Success Among Underrepresented Minority Engineering Majors". We are currently investigating factors that enable minority engineering students to succeed at a large, predominantly white U.S. public university. We also investigate factors that lead to the differential success of African American, Hispanic, and Native American students in this three-year longitudinal ethnographic study.

During this study we noticed patterns of ASAM student behavior and belief that seem to contribute to student ability to obtain an engineering internship. Particularly, participants who had attained internships were more likely to participate in technical societies than those who

had applied for internships and not attained them, or those who had not applied for internships. These patterns suggest deficiencies in ASAM student knowledge of professional expectations and practices, called cultural capital by Bordieu (1977a, 1977b) that members of minority groups (not just URM) typically lack.

Research Methodology

Potential research participants were identified from rolls generated by the University of Oklahoma's department of Institutional Research and Reporting that listed all African American, Native American, Hispanic, and Asian American students who are enrolled as majors in the College of Engineering at the University of Oklahoma (OU). Students in their first year of study at OU were not solicited. Participants completed informed consent forms, and were surveyed to obtain factual information related to their background and college experience. Participants were compensated 35 U.S. dollars for their participation, as approved by our Institutional Review Board.

The semi-structured interviews lasted one to two hours. The interviews were audio recorded. Participants were asked about their academic and family backgrounds, campus involvement, career development, and experiences in their engineering courses. Interview recordings were then transcribed and reviewed for accuracy. Interview transcripts had information that might reveal the identity of the student concealed. The content of the transcript was categorized into codes using NVivo qualitative analysis software. This research methodology is similar to that employed in seminal works on the culture of engineering (Seymour & Hewitt, 1997; Margolis & Fisher 2002).

When quoting from participants, we use the following conventions. Editorial editions to clarify the context of the student's words are put in square brackets. Ellipses (...) are used to indicate places where irrelevant words or sentences were omitted from the quote. Parentheses are used to indicate words whose transcription is uncertain, despite our best efforts. Words in curly braces denote substitutions that were used to conceal information that might identify a participant.

Results

During the first year of study, we performed eighty interviews. Twenty-one of those interviews were ASAM students. While this may seem to be a small number of interviews to researchers accustomed to statistical surveys, this represents well over six-hundred pages of interview data. Data sets of this size are common in ethnographic research (Leydens, Moskal & Pavelich, 2004). Participant majors include chemical engineering, petroleum engineering, civil engineering, computer engineering, computer science, electrical engineering, environmental science, and mechanical engineering. Since some degree programs have a small number of ASAM students, we have concealed participant majors in the quotes and discussion to conceal our participants' identities. No patterns related to student major were discerned.

During each interview, participants were asked whether they have had an internship and their future plans in obtaining internships. Participants responses were grouped into four categories: a) those who been offered an internship in their major, b) those who accepted an internship outside their major, c) those who applied for internships but did not receive an offer, and d) those who had not applied for an internship. Of the twenty-one participants, five self-identified as having received an internship offer or the equivalent, such as a job offer or undergraduate research assistantship. One self-identified as having an internship outside of his major. Four participants had sought but not received an offer for an internship at the time of the interview. Nine participants had not applied for an internship. The remaining two participants said nothing about internships and were therefore not categorized, although it seems likely that they belong in the last category.

Participants who Had Been Offered an Internship in their Major

All of the five ASAM participants who received an internship or an undergraduate research assistantship were involved in a technical society or actively involved in many campus activities. Out of these five participants, three worked during school (at a job other than an internship within their major), three participated in a technical society and the other two participated in other campus groups. One student participated in OU's Asian American Student Association (AASA). Four students were in the final two years of their degree program, as might be expected.

The fifth participant, a female second year student, was offered an internship but did not accept the offer because of family obligations. She was actively involved in many on-campus student organizations which included the AASA, Vietnamese Student Association (VSA), Filipino Student Association (FSA), Dean's Leadership Council (DLC), an Asian-interest sorority, and an ethnic dance group. She found her internship through a career fair and worked twenty hours a week in a job unrelated to her major. Regarding her decision to turn down the offer and the importance of internships, she says,

That was a big, big, big mistake. I found out the next year that it could have been my foot in the door with {a major employer in her field} ...[You] have no idea how good it can be for me. It is important for engineers. Internships are very important.

Participants who Accepted an Internship Outside Their Major

One participant, a third year male, reported he had an internship outside his major. He was an active member of AASA and VSA. Even though he searched for an internship within his major, he learned about an internship unrelated to his major in the public service sector from friends.

Participants Who Applied for Internships but Did Not Receive an Offer

Four participants applied for internships, but did not receive an offer at the time of their interviews. None of them actively participated in an engineering technical society. Of the four participants, most utilized several job search resources to apply for an internship. Half of them worked during school and the other half did not. One participant was in an Asian-oriented fraternity and another participated in AASA.

The first participant, a fourth year male student, was an active member of an Asian-interest fraternity. He worked fifteen hours a week outside of his discipline. He searched for jobs by networking, attending career fairs, utilizing the university's Career Services, and surveying online job application sites. His internship search criteria were broad—investigating internship opportunities in markets that do not typically advertise specifically toward people in his discipline. He, however, did not begin hunting for internships until quite late in his college career because of his involvement in a branch of the Reserve Officer Training Corps (ROTC). His ROTC participation affected his opportunity for an internship.

[One] reason why I haven't had a career related job is because when I was in ROTC, I was guaranteed a job after college. So when everybody was doing Career Fairs those first two years I was really stuck with, I don't need it, I already have a job...I don't need to make my résumé up or whatever and then when I stopped it I took a career planning class last semester. I tripped. After that when I realized I couldn't come back or I didn't want to come back, I started looking around and thought "gosh man, this has really gotten competitive" and then I started looking applying for internships. It wasn't good. My résumé sucked so I took a career planning class last semester and that helped me out a lot so. I think I'm still new in the job search so hopefully I'll get something.

A third year female participant was a member of AASA and worked sixteen hours a week. She attributed her difficulty in obtaining an internship to her low GPA, saying, "Like right now I have like a 2.9 GPA, which is such a big thing because everybody wants like a 3.0."

A third year female participant attributed her difficulty in obtaining an internship to her lack of prior laboratory experience, stating:

I went to a career fair and I had a gazillion interviews. I had all of these interviews, but I think that because my experience wasn't there yet. I didn't have any experience working in laboratories and I think that is one big thing they were looking for. That really did hinder me. I had eight interviews and I got turned down for four, that I know of, and four I haven't heard back from which is really rare, I think. I am about to send them an e-mail saying excuse me, you forgot about me. They probably just forgot and rejected [me].

She recently learned about the availability of undergraduate research opportunities in her major. These opportunities are paid and have many of the same professional benefits as internships, and are therefore included in the same category.

I had no idea that there was so much undergraduate research going on with my professors and all I had to do was ask them. I didn't even know they existed until last semester. I knew they were there, but I thought it was like all TA's [Teaching Assistants] are really really smart kids that they had picked. So if they had asked me I would have been like yes. I was never asked. I thought maybe I wasn't good enough. I never knew and I should have done that. It is the one thing that I am kicking myself in the butt. ... If I don't get an internship this summer, that is okay with me, because I just found out that there are huge research opportunities for me here that I didn't even know about. If that's the case, I will just stick around here. They were saying that in itself is kind of like an internship...am pretty excited about that. They said I am pretty much guaranteed a spot and all I had to do is ask. ... I am pretty much a year behind. I should have done this a year ago. It is so sad.

The last participant, a fourth year female, was not a member of any campus organizations, and applied through the university's Career Services, the engineering career fair, and internet job resources. She did not work and she reported that she did not know how to join campus organizations. She desired membership in VSA so her "résumé can look good."

Participants Who Did Not Apply For an Internship

Of the nine participants who have not applied for an internship, four stated they would be searching for an internship later, usually for the summer of the following year. Seven of the nine participants in this category were in their third year of study, the remaining two were in their second year. None of the nine participants was a member of a technical organization, or appeared to have prioritized searching for or applying for internships. Four of the nine worked during school. Three of the participants participated in a campus organization; one of them participated in AASA.

The participants' reasons for not applying for internships included:

- Taking summer courses
- Participation in the marching band
- Expense of registering with Career Services (\$50 registration, plus \$25 maintenance fee each year)
- Need to help with family business
- No desire to work as an engineer
- Fear of being required to leave the state of Oklahoma, and separating from family

Some of the participant's stated reasons were rather nebulous. For example, a third year male participant said, "I don't know [when I'll seek an internship], next year I guess and get some more stuff done, yeah."

Two participants have searched for internships, but have not yet applied. One is a third year female participant, neither active in any campus organizations nor a member of a technical society. Lack of confidence and qualifications was her reason for not applying:

Getting an internship, I am still trying to find that. I think I just have to get myself out there more or something to get an internship. I guess I don't feel confident about myself. There are some internships that I didn't sign up for because I didn't feel qualified to do them, because it lists these qualifications and there are a couple that I didn't even know about.

Participants With No Mention of Internships

For two participants, the topic of internships was not mentioned in their interviews. One was a third year male student in the ROTC. He was pursuing a career in the military, and assumed—like our other ROTC participant—that he did not need an internship. He was not involved in any technical societies or campus organizations. The other was a second year student who made no mention of college organizations, technical societies, or internships in his interview.

Discussion and Conclusions

Our data shows that students who participate in technical societies have more success in attaining internships than students that do not. Participation in ethnic or racial organizations, like ethnic fraternities or sororities, and AASA or VSA does not correlate with internship placement to the degree that technical society participation does. Our data suggests that non-discipline-related employment neither helped nor hindered a student's ability to obtain an internship offer.

It is possible that the most technically proficient students happen to both join technical societies and receive internship offers, but a closer look at the quotes from students who did not receive an internship offer tells a different story. The students lacked knowledge of how the game is played: Bourdieu's cultural capital (Bourdieu 1977a, Bourdieu 1977b). Examples include the female second year student who turned down an internship without realizing that it could lead to a permanent job, the ROTC member who had to take a class late in his academic career to learn to write an acceptable resume, the third year female student who didn't realize that undergraduate research assistantships in her major were available for the asking, and the fourth year female student who didn't know how to join campus organizations and thought that joining an organization (without necessarily participating or leading) would make her resume look good. It should be remembered that we did not interview first year students. Our participants are seasoned college veterans. Lack of cultural capital is typical of members of non-dominant cultures, which in the U.S. includes ASAM culture, and as the culture of other racial and ethnic minorities.

Participation in technical societies is one way that members of the non-dominant culture can gain access to the cultural capital of engineering. A technical society gives students a social network, in which the cultural knowledge of engineering can be shared. Technical societies can allow students to learn the rules of the game, which is one step towards leveling the playing field for members of all racial and ethnic groups. When the group of students who applied for but did not receive internships is compared to the group of students who both applied for and received an internship, it becomes apparent that the unsuccessful applicants used more resources in the search for an internship than the successful applicants. It seems intuitively obvious that the more resources a student uses, the more likely they should be successful, although our data does not support this. Students who participated in technical societies seem to have been guided to internship opportunities that would be more likely to pan out, thus eliminating the need for a broad search. Having obtained an internship, these students will also have an advantage when they are looking for their first job after college. Advantage tends to accrue.

It is important that faculty at U.S. universities understand that ASAM students are still minority students, even though they are not under-represented in engineering. ASAM students might benefit from a ASAM-specific technical society, similar to those that are available to other URMs. This kind of organization could provide ASAM students with confidence, leadership experience (which none of our participants had), and ultimately some of the cultural capital they may be lacking.

Whether these benefits are obtained or not will depend on how the people within the dominant culture respond to such an organization. Members of the dominant culture in the U.S. commonly believe that ASAM individuals are quiet, well behaved, mathematically and scientifically gifted, academically successful, and more disciplined than individuals from the dominant culture. This set of beliefs is called the model minority myth (Lee 1996). This myth can be used by Caucasians to denigrate other racial and ethnic groups, particularly African-Americans (Wu 2002). There can be tension between the African-American and ASAM communities, particularly in large cities in the U.S. (Zia 2000). While the model minority myth presents a far more attractive picture of ASAM individuals than the cultural myths of other racial minorities in the U.S., it could lead to a backlash against an ASAM technical organization. If ASAM students are already better engineers than Caucasian students, as the model minority myth would imply, why do they need their own technical society? This type of reasoning is how members of the dominant culture try to protect the advantages they have experienced (often unknowingly) for the benefit of their own children. In the extreme, this could incite unreasonable racial anxieties of “yellow hoardes dominating the U.S.”, another cultural myth similar to those which lead to the death of Vincent Chin in Detroit, Michigan in 1982 (Zia 2000). An incident of this magnitude thankfully seems unlikely, although a negative response of lesser dimensions seems plausible.

A less controversial idea would be having technical societies on campus reach out to ASAM students. This could be done by providing more membership materials which feature ASAM faces, as is commonly done for other racial and ethnic minorities. Sharing more cultural capital in the engineering curriculum would also be helpful. At the University of Oklahoma, for example, we've recently redesigned our introduction to engineering class to provide cultural capital to everyone, including required participation with an undergraduate student mentor in the same major discipline. We've also lowered the fees for Career Services, to encourage students to apply for internships and jobs.

Acknowledgements

This material is based upon work supported by the National Science Foundation's Directorate of Undergraduate Education's STEM Talent Expansion Program Grant No. 0431642. Any opinions, findings and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

The authors acknowledge the contributions of the following individuals: Rosa Cintron, Jeanette Davidson, Tiffany Davis, Cynthia Foor, Francey Freeman, Van Ha, Quintin Hughes, Teri Jo Murphy, Mayra Olivares, Tracie Revis, Teri Reed Rhoads, Paul Rocha, Lisa Schmidt, Randa Shehab, Jeff Trevillion, and Susan E. Walden.

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