

# NACME ANNUAL SCHOLAR SURVEY

2021 - 2022

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THE NATIONAL ACTION COUNCIL FOR MINORITIES IN ENGINEERING, INC. (NACME) WAS ESTABLISHED IN 1974 BY A GROUP OF CONCERNED BUSINESS LEADERS TO DEVELOP AND CATALYZE A SUITE OF STRATEGIES TO INCREASE THE PARTICIPATION OF UNDERREPRESENTED MINORITIES IN ENGINEERING.

**NACME**

NATIONAL ACTION COUNCIL FOR  
MINORITIES IN ENGINEERING

# Executive Summary



**The National Action Council for Minorities in Engineering, Inc. (NACME)** was established in 1974 by a group of concerned business leaders to develop and catalyze a suite of strategies to increase the participation of underrepresented minorities in engineering. In recent years, NACME has also expanded to include a focus on broadening participation in computing. As a primary part of its core research mission, NACME has articulated the goal of documenting the various factors that contribute to the success of minority students in engineering programs.

Presented in this document are results from the 2021-2022 annual NACME scholar survey administered during the Fall 2021 academic term. Scholars at each of the 35+ partner institutions were invited to participate. The survey was designed to explore the range of activities students are participating in and their sentiment about these experiences both in the academic setting as well the workplaces they have encountered as interns or co-op students. Numerous insights can be gleaned from this study to promote success in engineering and computing and yield new models for advancing the participation of members from historically underrepresented groups at every phase of educational achievement. Key take aways for NACME, partner institutions and corporate partners are below:

- ▶ Early and meaningful work experiences for scholars can be an effective strategy for recruitment. 87% of scholars indicated an interest in working for their internship/co-op employer.
- ▶ Scholars tapped into an array of resources to secure their positions and NACME Events (Career Center and Virtual Career Fair) ranked high on the list behind: (1) Applied through the company website (2) On campus recruitment
- ▶ Membership in a professional society often contributes to a positive sense of belonging, yet the greatest fraction of scholars (160/387) indicated they are/were not part of the organizations listed (NSBE, SHPE, AISES, SWE). The NACME Scholar engagement and professional development activities are providing essential professional development for this community of scholars.
- ▶ Over 57 % of scholars indicated they had an internship or co-op experience. The majority of the scholars who responded to this item (n=129 or 73.71%) felt that their internship was either very related or extremely related to their major, with extremely related indicated as the most frequent choice.
- ▶ NACME scholars are exceling academically and express high confidence in their ability to persist in their chosen major. Over 97% of the 382 students responded that they were confident in their chosen major. Students at different stage of their academic pursuit provided feedback with third year students being the largest group at 135 and a fairly even distribution of first, second, and fourth year students at 82, 83, and 71 respectively.
- ▶ While students expressed confidence in persistence, the study also explored participants beliefs about the engineering profession and ability to be successful. Scholars' responses tended to lean towards affirmative or positive responses to each of these items. However, the items with the lowest mean scores related to belonging.

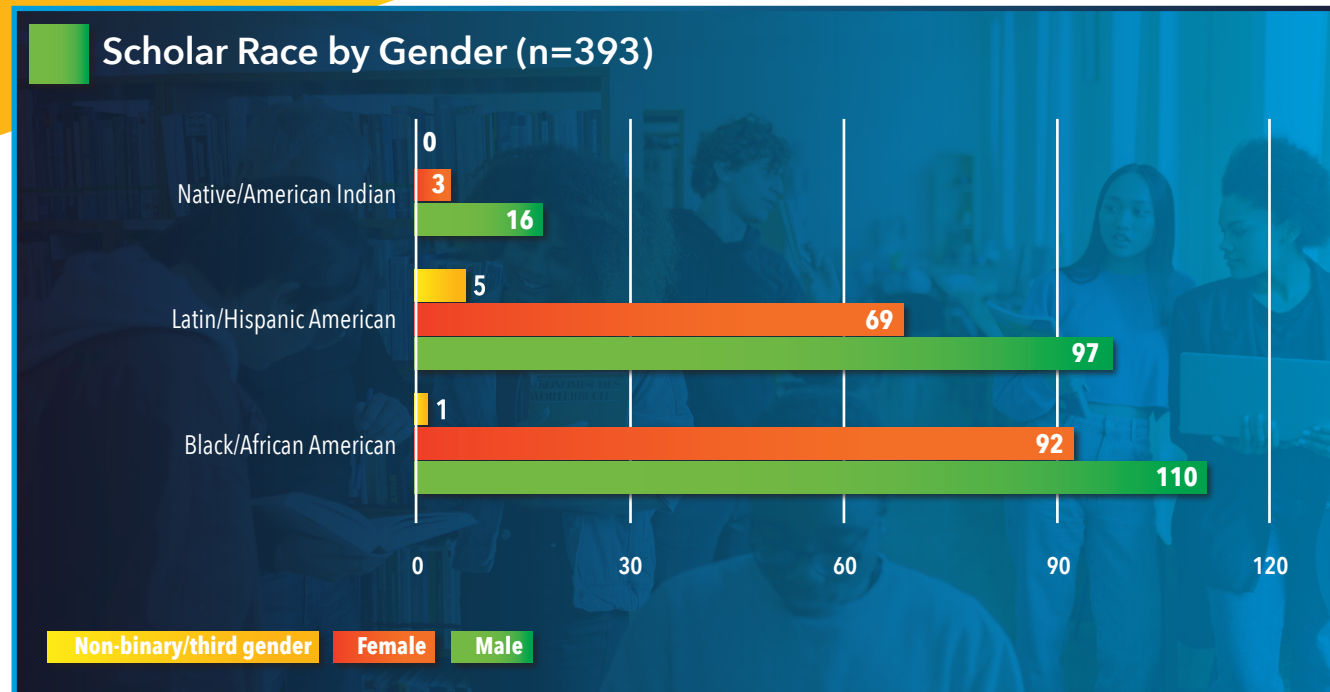


PART 1

# Who are the Scholars?

The 2020 – 2021 Scholars' Survey received a total of 398 responses that provided their current academic level. The largest percentage of scholars (27.4%) indicated that they were third year bachelor students at the time of the survey administration. High school students made up 18.9% (n=93) of the respondents and graduate students made up .4% (n=2) of the respondents. Scholars remaining categorized as "Other" after data cleaning were at academic levels which were unclear.

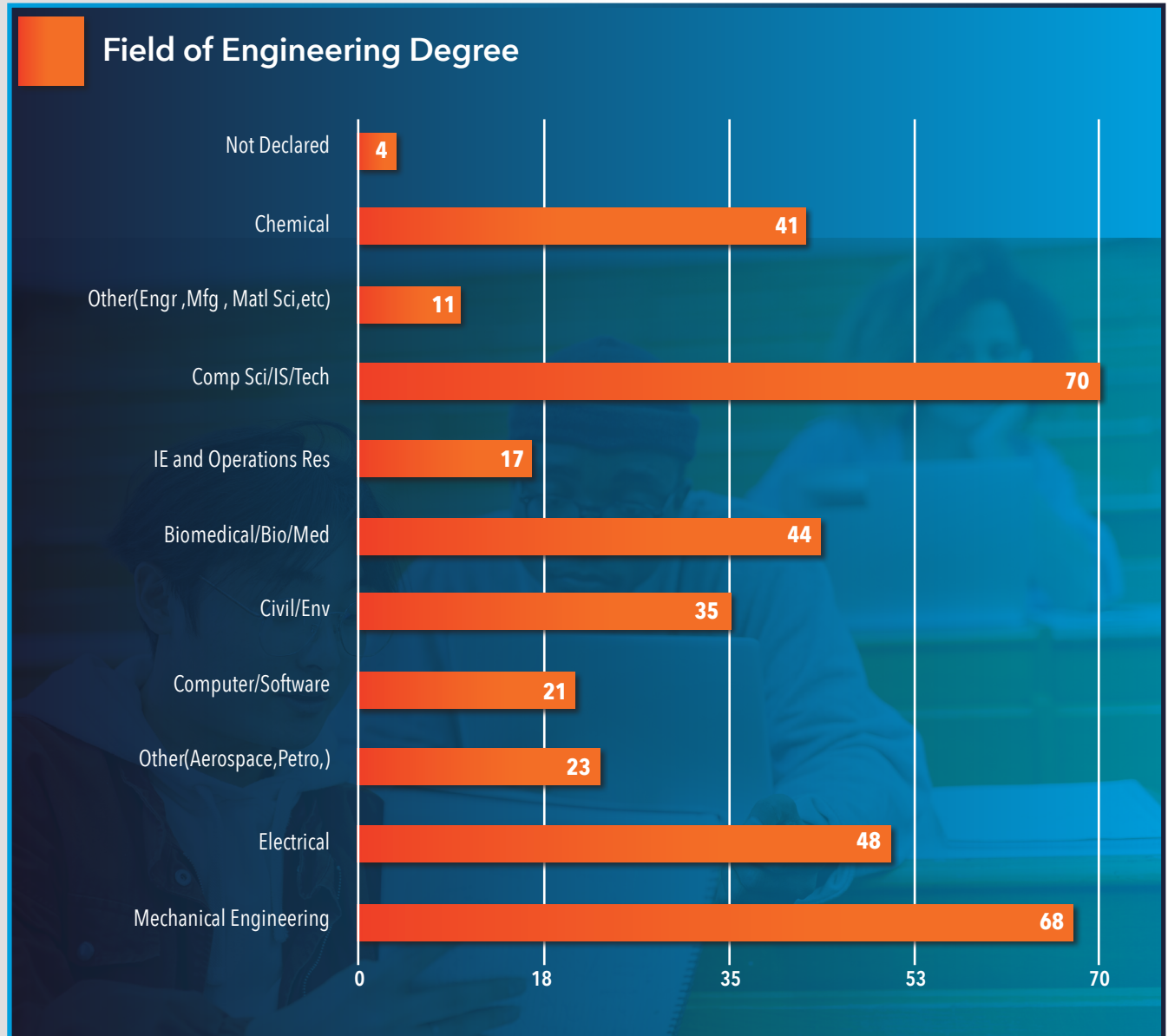
The scholars were asked to indicate what schools they were attending. Responses were received from 317 scholars with the greatest number of scholars attending the University of Arkansas (n=18).



Of the scholars, 393 provided their racial/ethnic background as well as their gender identity. There were 223 (56.7%) scholars who identified as male, 164 (41.7%) who identified as female, and 6 (1.6%) who identified as non-binary/third gender. Most scholars identified as being Black/African American (n=190, %=48.4). **Figure 4** provides an summary of the scholars' racial/ethnic identity based on their gender identity.

Figure 4 / Scholar Race by Gender (n=393) /

**Scholars were asked** to select the field(s) in which their primary degree is/are in. A total of 31 majors were indicated in addition to not declared freshman and not declared upper-classman. There were 57 additional majors indicated by the scholars beyond their primary majors as well. Figure 5 denotes the primary major.

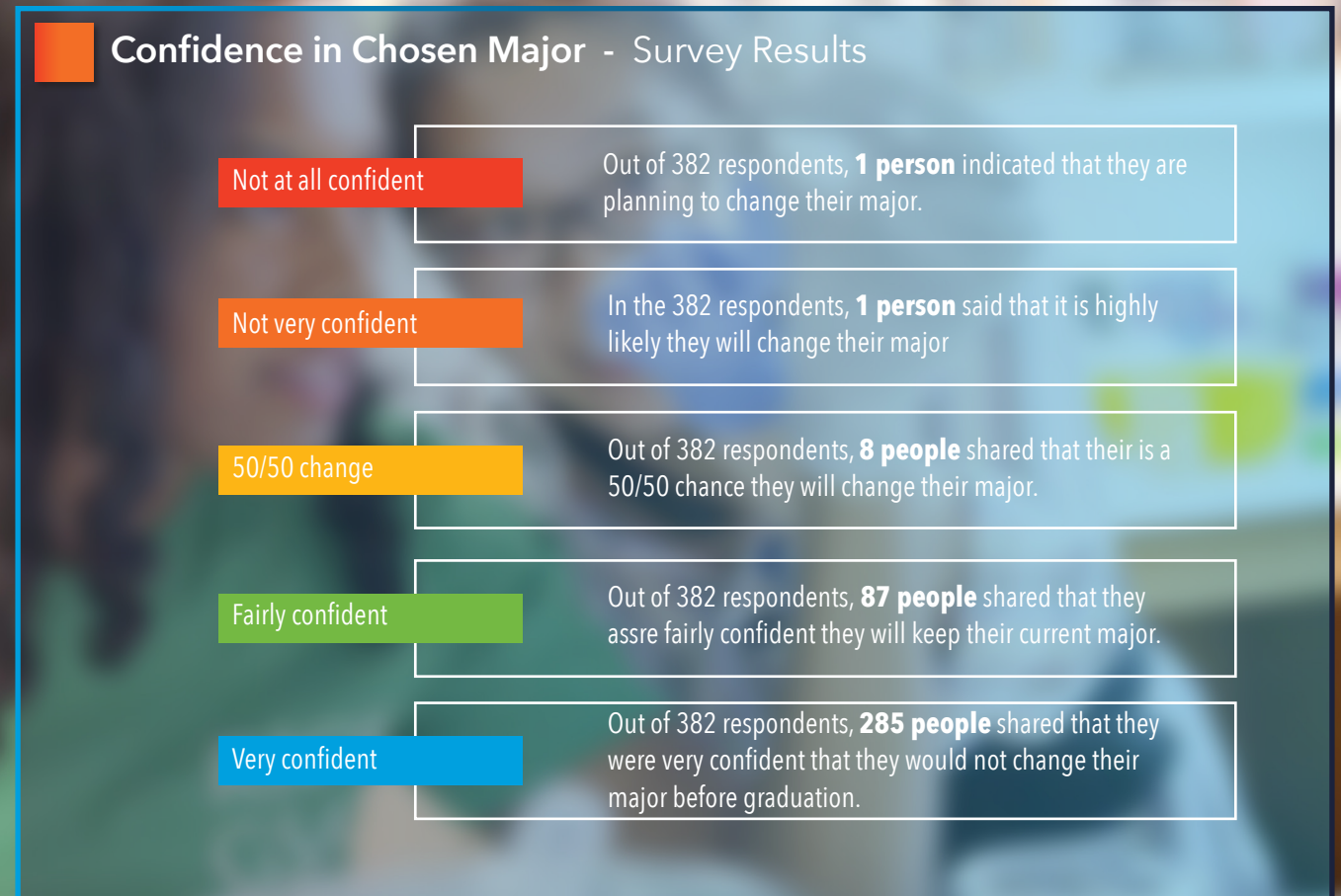


/ Primary Field of Engineering Degree (n=382) / **Figure 5**



**As a means of understanding** their confidence in their chosen major, scholars were asked to indicate the likelihood that they would change majors. Of the 382 responses, most scholars were very confident in their chosen major and thus, did not feel that they would change majors. Figure 7 represents the responses received from the scholars to this item.

In addition to their primary and additional majors, Scholars were asked to indicate whether or not they had minors. Of the 378 responses, 90 (23.8%) did have minors while 288 (76.2%) did not have minors.

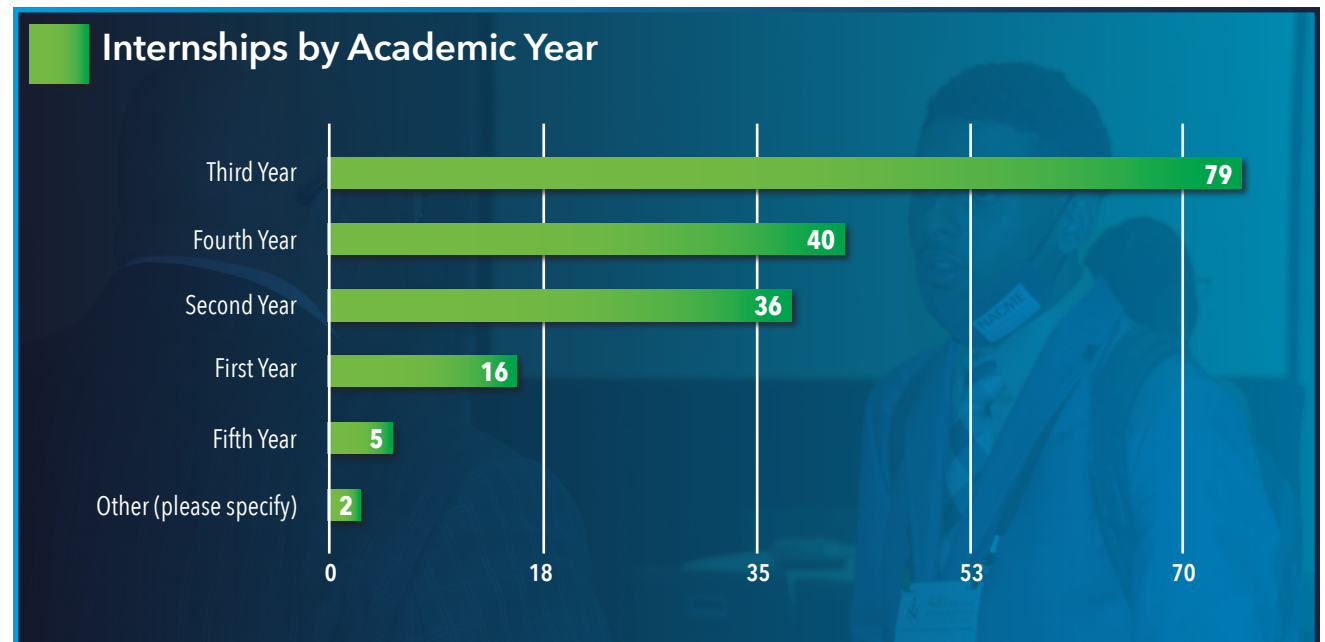


**Figure 7** / Confidence in Chosen Major (n=382) /

PART 2

# A deep dive into internships/job opportunities

**Scholars were asked** whether or not they had had an internship within the last 12 months from the survey administration date. Of the 311 scholars who responded to this item, 178 indicated that they did. Ninety-seven of these responses were from male scholars, 79 from scholars identifying as female, and 2 from scholars identifying as non-binary/third gender. When broken down by academic year, scholars who were in their third year of undergraduate studies had the greatest participation in internships (see Figure 9 below).



/ Internships by Academic Year / Figure 9

When the scholars' responses are broken down by race/ethnicity, the grouping with the largest number of internship participants (n=84) is Black/African American while the grouping with the smallest number of internship participants (n=2) is Native/American Indian/White. Figure 10 depicts the breakdown of internships by race/ethnicity.

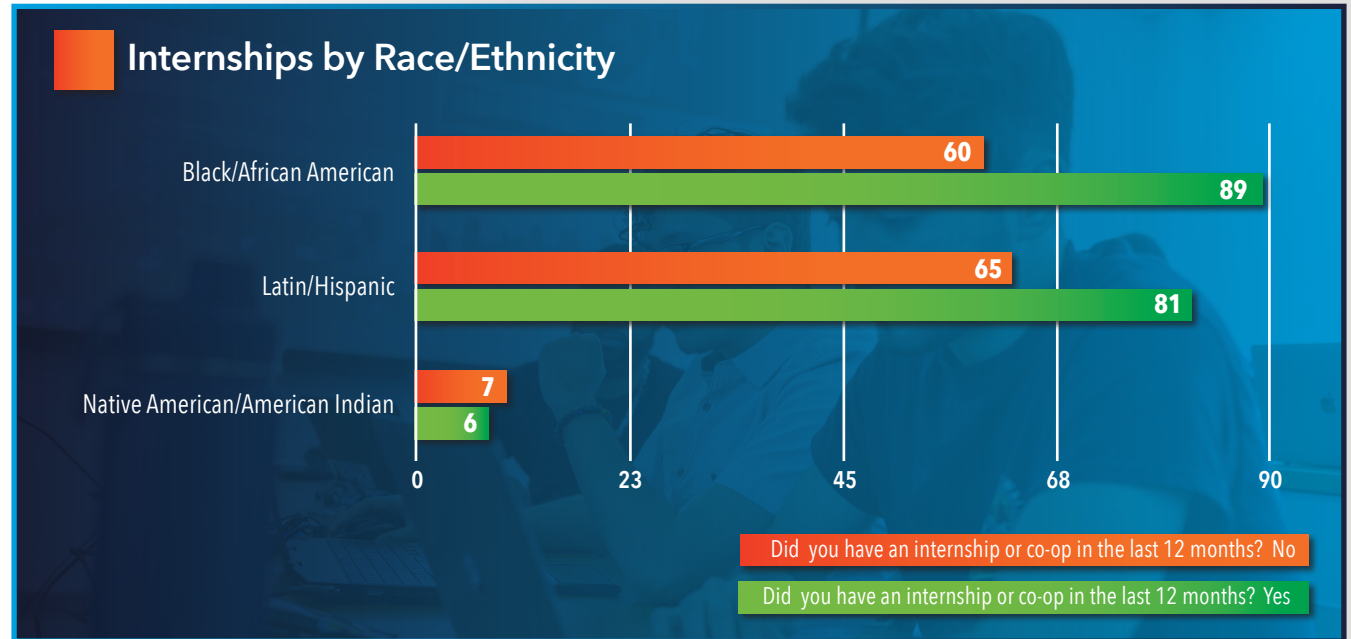


Figure 10 / Internships by Race/Ethnicity /

In breaking down who had internships by gender, we found that the proportions of each gender by yes and no aligned with the total number of each gender within the sample. Figure 11 depicts this dynamic.

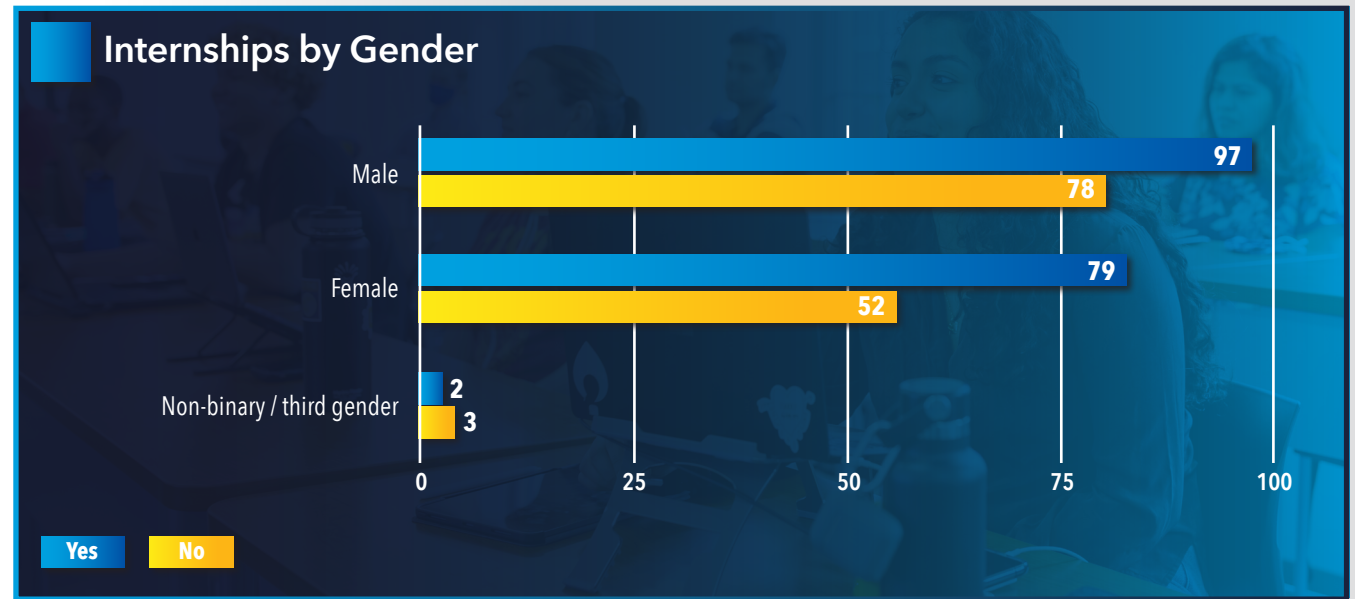


Figure 11 / Internships by Gender /

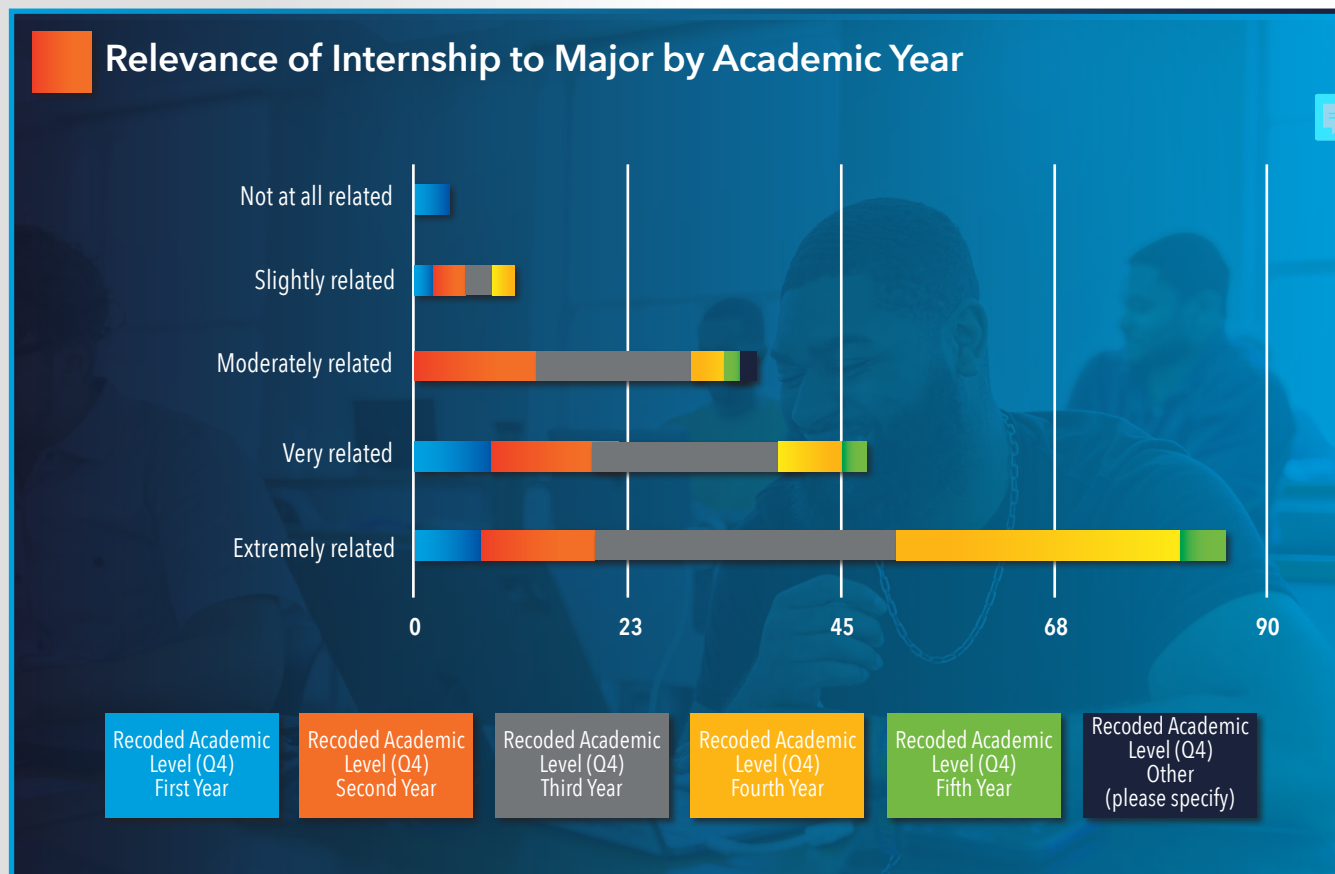


**When explored by gender**, we find that it being a first time internship experience and not being a first internship experience are quite close for male and female. For non-binary/third gender, it was the first internship for everyone who responded to the item (n=2).

Looking at the data by race/ethnicity, we find that the Latin/Hispanic first time and repeat experiences number closely to Black/African American experiences with internship.

Internships provide an edifying professional development experience for students. However, on occasion the internships obtained by students may not be relevant to their respective academic major. Thus, scholars were asked to rate the relevance of their internship to their major. In rating the relevance, 47.43% felt that their internship was extremely related to their major. The majority of the scholars who responded to this item (n=129 or 73.71%) felt that their internship was either very related (n=46) or extremely related (n=83) to their major. Scholars who were third and fourth year students indicated the greatest relevance of their internship to their major.

Figure 15 illustrates the relevance rating by academic year.



/ Relevance of Internship to Major by Academic Year / **Figure 15**

**When exploring relevance** of internship to academic major by race/ethnicity, we found that the grouping which represents the largest percentage of the responding scholars (Black/African American), reported most frequently that their internships were either very related or extremely related (n= 61). Below, Figure 17 provides a visual breakdown of the responses.

Exploration of the relevance of the internships to major by gender yielded nothing of significant note as population proportions aligned with the responses.

Scholars were asked whether or not they would work for the company at which they interned if they were to receive an offer for a position. When exploring the responses by academic year, third years (who also had the largest percentage in internships of all the years) had the greatest number say yes (n=61) with fourth years lagging not too far behind with 36 scholars indicating that they would say yes. Close behind the fourth years were the second years with 34 indicating that they would take a job offer from the company they interned with.

Very few scholars said that they would not work at the company they interned with, this becomes very clear when we look at responses by gender.

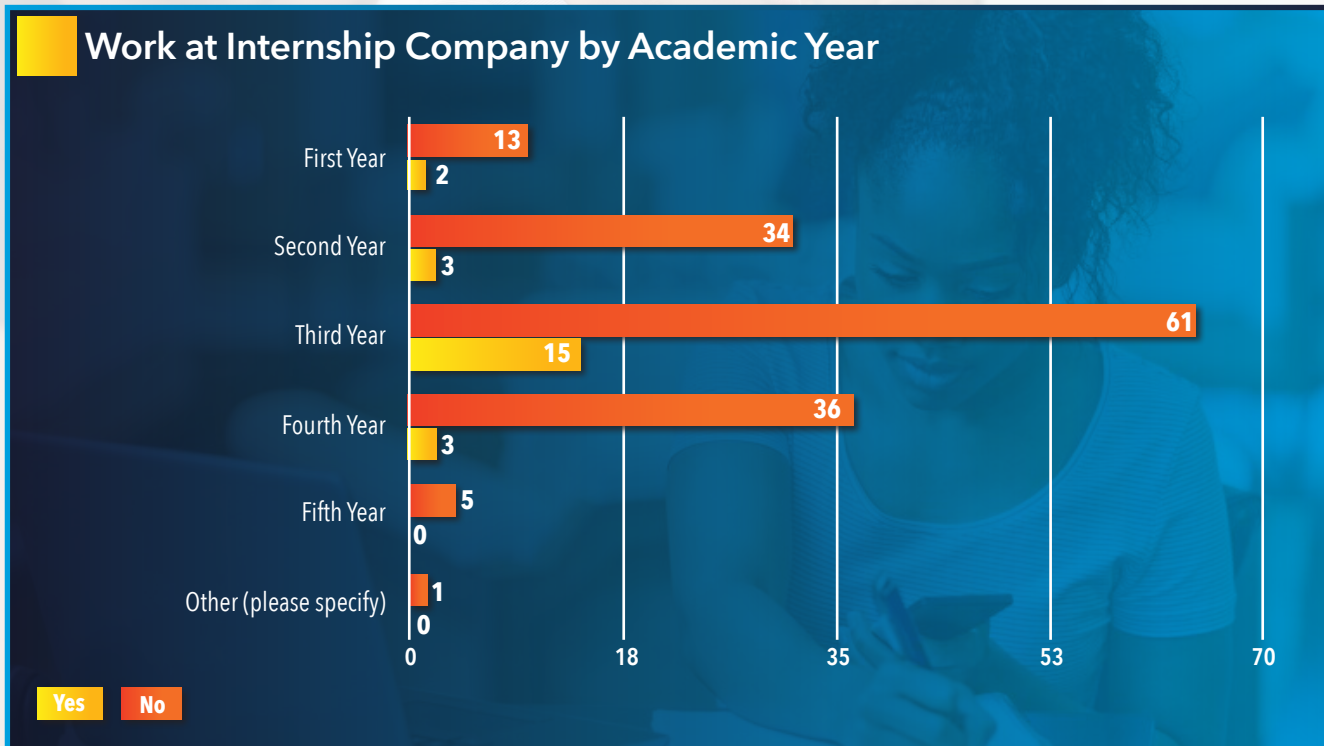
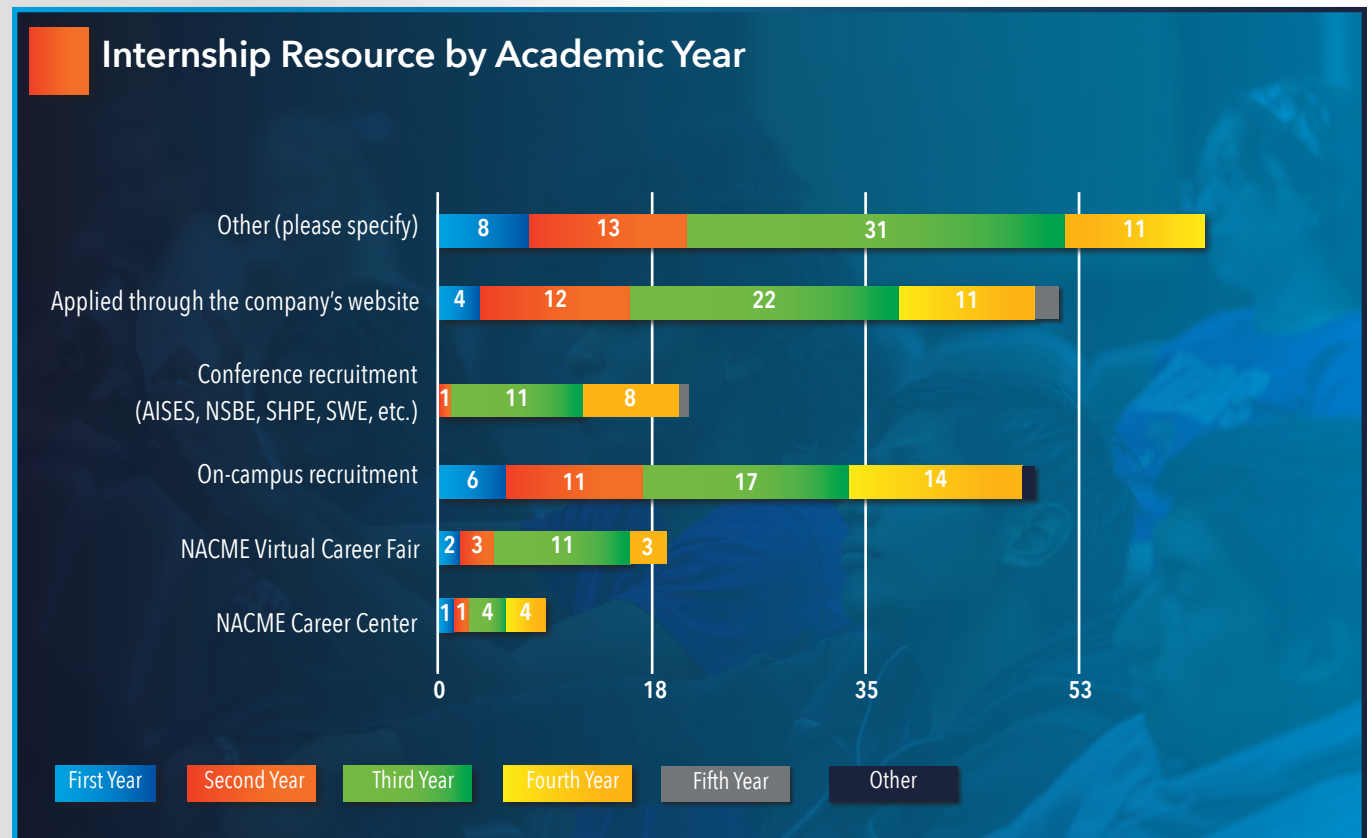


Figure 17 / Work at Internship Company by Academic Year /

**Exploring the responses** to whether or not the scholars would take a position if offered by the company at which they interned by Race/Ethnicity again highlights the sheer number of scholars who said yes. Response proportions align with the sample representation.

Understanding the experience and outcomes of internships are extremely important. Backtracking for just a moment, we investigate the avenues by which the internships were obtained. It is quite important to understand the resources that the scholars are utilizing to find their internships. Scholars were given a list of resources and asked to identify those they leveraged. Figure 20 below summarizes their responses by academic year.



/ Internship Resource by Academic Year / **Figure 20**



Source	n	%
Advisor	1	1.61
ANSEP	2	3.23
Application	1	1.61
Career Center	3	4.84
Career Fair	3	4.84
Coach	1	1.61
Coca-Cola Scholars	1	1.61
Company	2	3.23
Co-op	3	4.84
Email	5	8.06
Existing Internship	2	3.23
Family/Friend	4	6.45
Handshake	3	4.84
Honors College	1	1.61
Indeed	1	1.61
INROADS	1	1.61
LinkedIn	3	4.84
Manpower	1	1.61
NACME	5	8.06
Networking	1	1.61
None	2	3.23
Online	1	1.61
Professor	4	6.45
RARE	2	3.23
Referral	5	8.06
Self Search	1	1.61
SURE	1	1.61
Thurgood Marshall College Fund	2	3.23

**In breaking down** the internship resources employed by gender, we found that of the responding scholars the largest proportion of males utilized other resources to find their internship positions.

Investigating the data from a race/ethnicity perspective, we see that scholars identifying as Native American/American Indian only used company websites and other unlisted resources to identify their internship positions.

**Table 1.0** above provides a breakdown of resources students tapped to secure their internship. It should be noted that NACME, tied with referral and email as the top cited source used in this category.



## PART 3

## Belonging

**A 23 item belief scale** was included on the survey. Scholars' responses tended to lean towards affirmative or positive responses to each of the items. However, the items with the lowest mean scores related to belonging. These items include the following:

- 1) The other students in my classes share my personal interests (M=3.7).
- 2) I can succeed in an engineering program while NOT having to give up participation in my outside interests (M=3.88).
- 3) I can relate to people around me in my classes (M=3.89).
- 4) I will feel "part of the group" on my job if I enter engineering (M=3.97).

In order to understand the Belief Scale to a greater degree, we created an average score of the entire scale. We explored these averages by academic year and found that in general, the bulk of the responses were 3.65 and above. Second year students recorded the three lowest scores. Third year students had the greatest number of scores 4.70 and above (n=36). However, First year students were not far behind (n=33).

Exploring the Belief Scale average scores by gender we find that the two lowest scores belong to scholars identifying as male. Of the five Non-binary/Third gender scores, we noted that three are located in the 3s of the scale. The highest score for a scholar identifying as Non-binary/Third gender was recorded as 4.43.

Exploring the Belief Scale average scores based on race/ethnicity showed us that scholars identifying as Latin/Hispanic had the most scores concentrated in the lower spectrum of 3.65 and below on the scale (n=15). Of the Native American/American Indian scholars, 8 had average scores which were above 4.70.

**A contributor to belonging** are professional societies. Scholars were asked to indicate which of five professional organizations they are members of. The greatest percentage of scholars indicated that they are not part of any of the listed professional organizations (41.34%). The National Society of Black Engineers or NSBE, was the organization that the most scholars indicated that they are members of (26.87%). Figure 27 details the organizational memberships of the responding scholars.

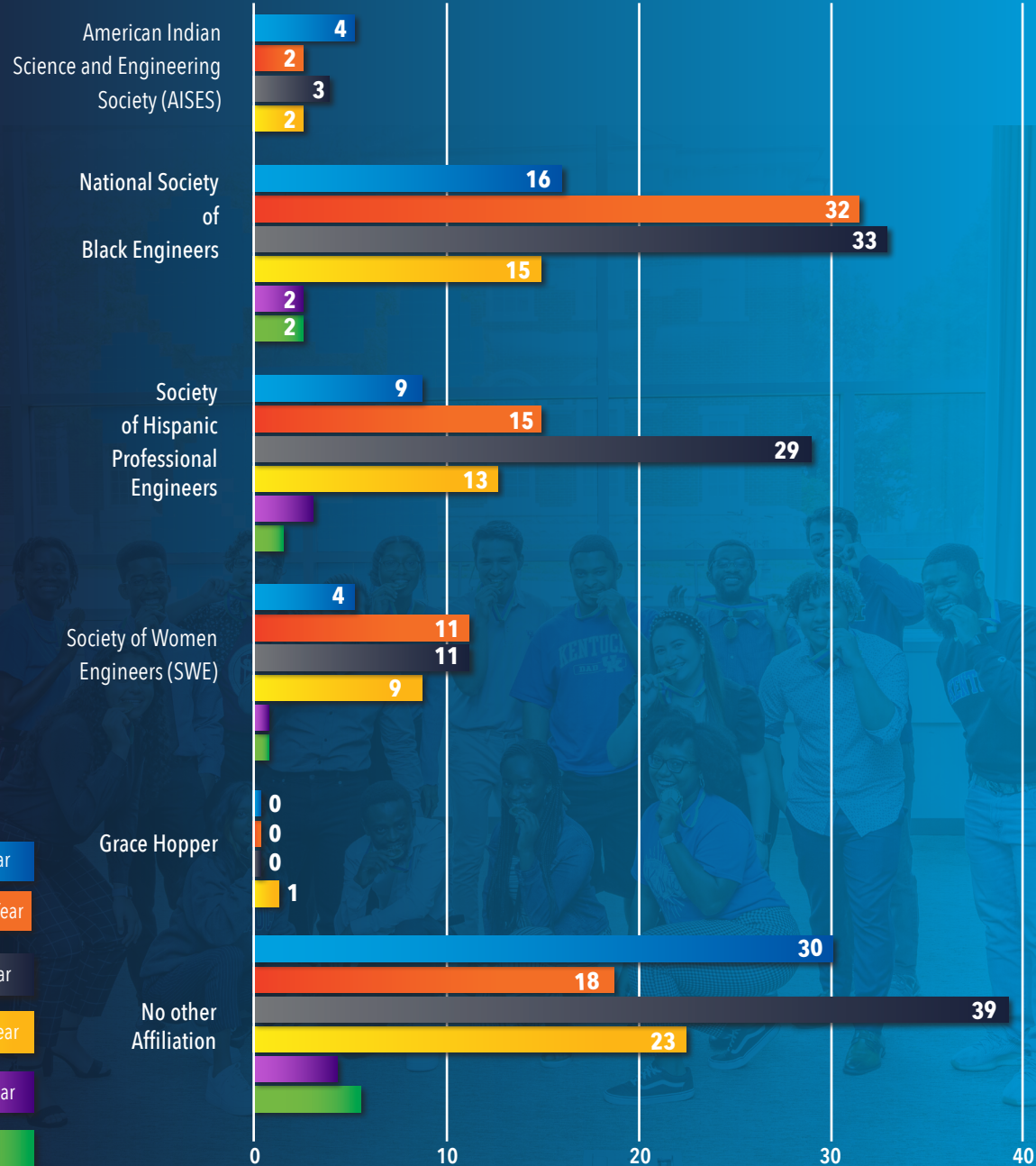
Taking a look at organizational membership based on academic year of the scholars, we see that third year scholars have more membership to the listed professional organizations than the other class years (n=115).



Figure 27 / Organizational Memberships /



## Organizations by Academic Year



**Taking a look at** organizational membership based on academic year of the scholars, we see that third year scholars have more membership to the listed professional organizations than the other class years (n=115).

Looking at the organizational memberships by gender, we see that scholars identifying as male have more memberships (n=191) than scholars identifying as female or non-binary/third gender.

Interacting with the data broken out by race/ethnicity, it is evident that more members of each respective race/ethnic group are members of the society targeting that respective group than the number of group members indicating that they are not members of any of the listed groups.

Finally, in exploring the organizational membership data based on school of attendance as indicated by the scholars, we find that Northeastern University has the highest rate of membership with 13 scholars stating that they were members of one of the listed organizations. Northeastern also had the highest rate of membership in NSBE, specifically (n=11). Figure 31 lists each of the schools along with rate of membership.

**Figure 28**

/ Organizations by Academic Year /



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