A BRIDGE PROGRAM TO ENGAGE, SUSTAIN AND EMPOWER WOMEN AND MINORITIES IN STEM

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TEXAS STATE UNIVERSITY
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NACTA
Hawai'i 2016
Gathering to Cultivate Student Success

OUTLINE

- Introduction
- Bridge Program
- Recruitment Activities
- Retention Activities
- Expected Outcomes
- Measurable Outcomes
- Results
- Q/A

INTRODUCTION

- The Importance of STEM Education
- Minority and Female Students in STEM
- What can we do?
  - High Schools
  - Universities
  - Industry

  - What employees look for

INTRODUCTION

- The State of Texas has the second largest Hispanic population behind California, and data from the Texas Board of Education (http://www.tea.state.tx.us/) shows that 5,151,925 students are currently registered in grades early education through grade 12. The ethnicity population distribution is shown in Table 1.

Ethnicity	Student Count	%
Black or African American	652,719	12.7%
American / Indian or Alaska Native	20,225	0.4%
Asian	189,906	3.7%
Hispanic	2,668,315	51.8%
Native Hawaiian	6,801	0.1%
Two or More Races	96,666	1.9%
White	1,517,293	29.5%
Total	5,151,925	100%

INTRODUCTION

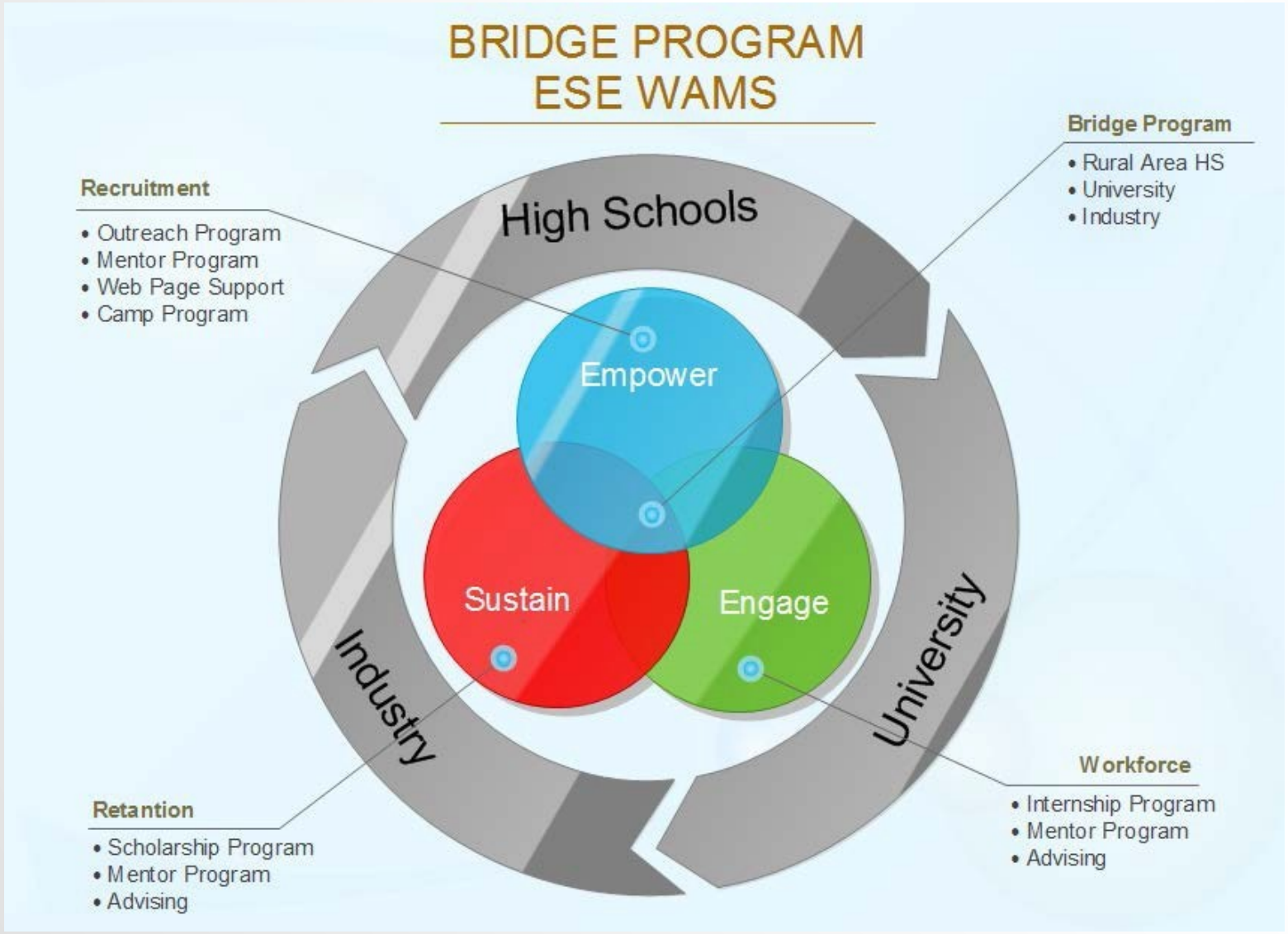
- When students graduate from high school and start higher education, the number of minority students drops dramatically.

Ethnicity	Undergraduate	%	Master	%	Doctoral	%
Black or African American	8,569	9.4%	3,384	10%	196	**5.6%**
American / Indian or Alaska Native	326	0.4%	111	0.3%	11	**0.3%**
Asian	6,425	7.1%	1,690	5%	156	**4.4%**
Hispanic	24,456	27.0%	5,618	16.5%	322	**9.2%**
International	2,233	2.5%	6,253	18.4%	1,259	**35.8%**
Multiracial	1,332	1.5%	431	1.3%	32	**0.9%**
Not reported	1,717	1.9%	853	2.5%	75	**2.1%**
White	45,647	50.3%	15,664	46.1%	1,468	**41.7%**
Total	**90,705**	**100%**	**34,004**	**100%**	**3,519**	**100%**

BRIDGE PROGRAM

- **ENGAGE:** Create a recruitment program to increase interest in science and engineering fields among women and minorities from rural high schools in Central Texas.
- **SUSTAIN:** Create a retention program to create educational experience which will include seminars, research, scholarship and career advising.
- **EMPOWER:** Recruit two cohorts of up to four female and minority students to participate in an Intel internship and workflow pipeline program.

BRIDGE PROGRAM



RECRUITMENT ACTIVITIES

- **Two Rural Area High Schools**
  - Lockhart High School
  - Gonzales High School
- **Recruitment Activities**
  - The outreach program is based on a visit to the high schools (which a focus on high school juniors and seniors) by two program professors, two minority students from Texas State University and two Intel employees to introduce students to STEM fields, collect data via surveys, deliver brochures and host a Q/A session.
  - Create a PIAZZA (www.piazza.com) web-based mentoring and advising support platform. We will encourage students and instructors to ask questions using this platform. The platform can be viewed and responded to by high school mentoring directors that include a Texas State University professor, two Texas State University students and one Intel employee. The selection of this group will be done by the program director.
  - Organize a science camp program. The science camp program is based on day-long visit to Texas State University and tour of the Intel Austin facility.

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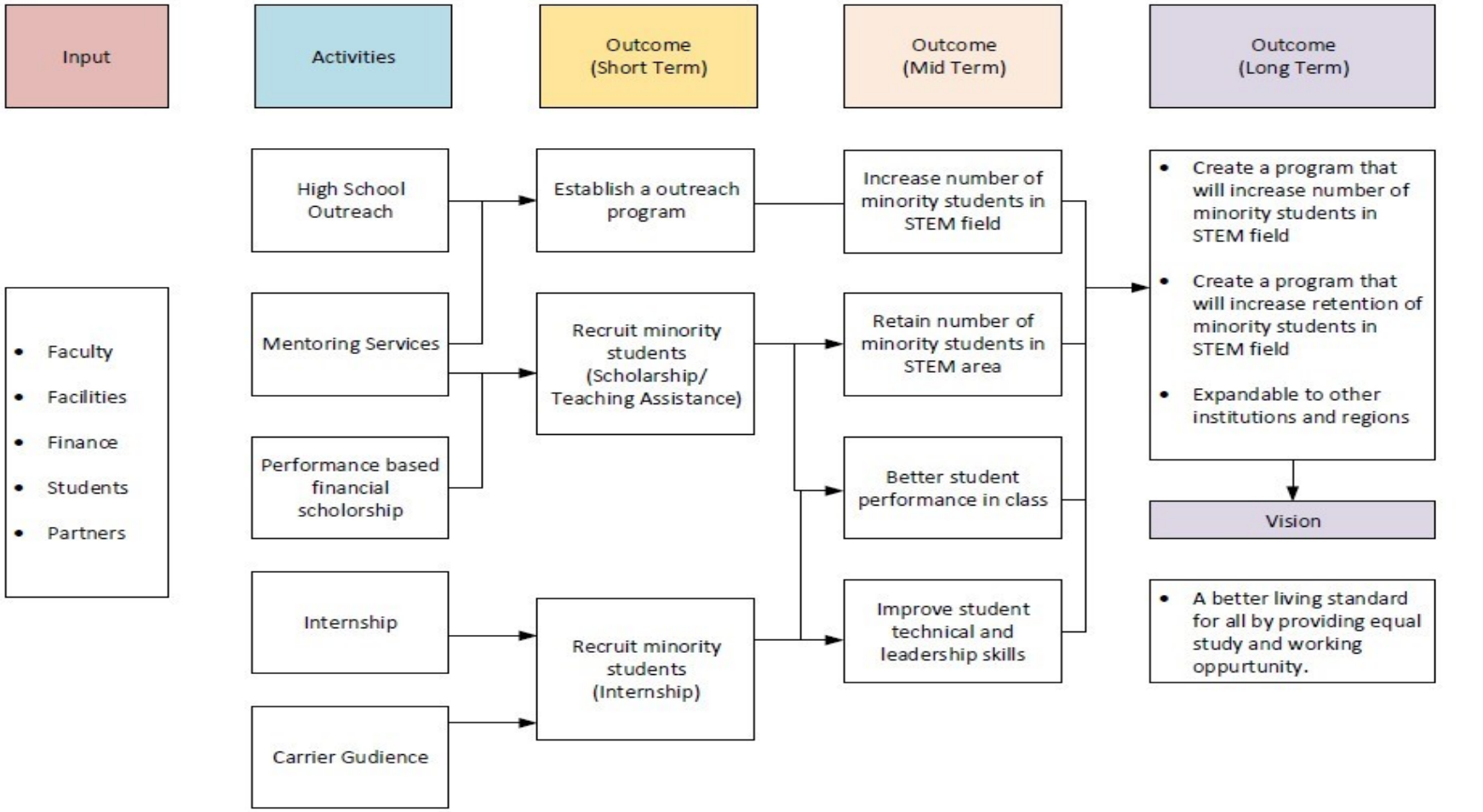
RETENTION ACTIVITIES

- **Retention Activities:** Retention activities focus on freshman, sophomore and junior students.
  - The first retention activity is based on identifying the freshmen, sophomore and junior minority students for survey and data collection. After students are identified, eight students will receive WAMS scholarships and two students will receive teaching assistant positions. These positions are awarded twice a year and four times during the grant lifetime. Students who receive these awards have to complete a monthly survey and attend 95% of courses during the semester. Students also need to volunteer for the high school mentor and outreach programs explained above.
  - The second retention activity focuses on the student mentor program that uses the PIAZZA (www.piazza.com) web-based mentoring and advising support platform. This mentoring platform will help students ask questions and share their experiences using this open platform. The platform can be viewed and responded to by college mentoring directors that include two Texas State University professors and one Intel employee.
  - The third retention activity is based on identifying the junior and senior minority students, survey and data collection. After students are identified, four students will receive a WAMS Intel internship. These positions are awarded twice during the lifetime of the grant. The students who are employed by Intel during the first year can continue their internship

LOGIC MODEL

Logic Model: ***A BRIDGE Program to Engage, Sustain and Empower Women and Minorities in STEM (ESE WAMS)***



Evaluation				
	• High school survey data • In-depth participant comments and data collections through interviews and surveys	• Student performance • Mentor survey • Performance on research and service assignment	• High School statistics • University statistics • Scientific materials produced	• Post program follow-up • Post program regional and national statistics and survey

EXPECTED OUTCOMES

- Increase in recruitment in STEM related fields from rural area high schools.
  - Successful mentoring program
  - Industry/academia outreach program
- Retention program that will create:
  - Zero unrelated off-campus jobs: Sponsored students' off campus/unrelated employment hours will be reduced to zero in this program.
  - 95% or more class attendance: Average class attendance for the sponsored students will be more than 95%.
  - 95% or more assignment submission: Average class assignment, quiz, project, and exam submission will be more than 95%.
  - 100% cross-disciplinary lecture and lab attendance. All of the sponsored students will attend at least one cross-disciplinary program proposed by the PM/CoPMs.
  - 100% mentorship. All of the sponsored students will attend at least one mentorship session per year with a faculty or expert of the field.
  - 100% community service. All of the sponsored students will participate in at least one community service event. Service opportunities related to education and awareness of the family, friends, and community about renewable energy, opportunities, and benefits to them will be encouraged.
- 8 internships: All sponsored students will be assisted in finding and completing an internship position in a relevant field and position.

MEASURABLE OUTCOMES

- 20% increase in recruitment of rural area high school students to STEM related study.
- 100% retention: All sponsored students will stay in the program and continue their education toward graduation.
- 100% scholarly activities: Each sponsored student will be involved in the creation of at least one scholarly/scientific product in the form of conference or journal article, patent, or academic presentation.
- 100% job placement program via the Intel internship program.

RESULTS - ENGAGE

- Create a recruitment program to increase interest in science and engineering fields among women and minorities from rural high schools in Central Texas.
- We created recruitment programs at both Lockhart and Gonzales high schools. We visited these schools, finished the preliminary work, trained instructors and met with some students. We started working on project days at high schools in which hands on electronics projects will be demonstrated to students. We will complete more data collection and analysis during the next cycle of the program.

RESULTS - ENGAGE

RESULTS - ENGAGE

RESULTS - ENGAGE

RESULTS - SUSTAIN

- Implement a retention program to create educational experience which will include seminars, research, scholarship, teaching assistantships, and career advising.
- Created a WAMS BRIDGE Scholarship program for 9 students for the first year of the program.
- Created a WAMS BRIDGE Intel Internship program for 11 students for the first year of the program.
- Created a WAMS BRIDGE Student worker program for 6 students for the first year of the program.
- Sent 2 students to present a poster and created a networking opportunity for the first year of the program.
- We have a 100% retention rate for a total of 28 students, and the majority of these students also improved their GPA. Students express an increase in their confidence and strong understanding of engineering.

RESULTS – SUSTAIN – STUDENT EXPERIENCES

- My internship at Intel has been a great experience though not without some issues. Over the past couple of months I have learned so much about what it's like to work in a professional engineering environment. The work I have done at Intel has given me a deeper understanding of the material taught at school. I've also learned new skills that I was not taught in school such as scripting languages. Intel has many resources such as an extensive technical library, online courses, and onsite technical courses that make it easy to gain the skills necessary to be successful at work. The work environment at Intel is a friendly one. Overall this has been a positive experience and I feel so lucky to have been chosen to participate in WAMS but the truth is that I still face many issues that plague low income minority students such as reliable transportation. Programs like this show minority students that their teachers, their government, and their employer are invested in their success.

RESULTS – SUSTAIN – STUDENT EXPERIENCES

- I am so excited for having the opportunity of an internship with Intel, this stage of my education is going to be a big push for my success on life as an Electrical Engineer. The way I see it, since day one everything that I have done has been a challenge in the positive way, meaning that I have been able to use totally different programming tool that I had no idea they were there. Intel requires a lot of programming skills and computer architecture knowledge among many other skills (Perl, Python, Maestro, powershell, CMD), which from my part I was lacking some of those skills, but now I feel more confident. Intel is a great place to work, it has a very relax environment and also the diversity is nice because one can learn so much from different cultures. Moneywise I cannot say anything wrong about it, it has been very helpful having that kind of income coming in for couple months and thankfully I will be working part-time during the fall semester. Thank you Dr. Aslan for your hard work, thanks to you I am an intern at Intel.

RESULTS – SUSTAIN – STUDENT EXPERIENCES

- Working at Intel has had its ups and downs. As a commuter to work from my home in San Marcos I have found that there is very little afternoon left after work. The commute takes me ~40 min and isn't very ideal but the pay is nice and the work experience is even better. I work on one of the few teams that treats there inters as 100% full time employees. There are 2 of us on our team of 12 employees and we are expected to deliver just as a full time employee would. I work in the Module Class Validation and have surprisingly put to use most if not all of my EE degree learnings. I have interned at other large companies but mostly only put to use coding skills... At Intel I've learned things in about classes I haven't even gotten to take yet. My team works on testing most every part of the processor and in order to do that we must have an understanding of the functionality for all of the hardware. There is a lot to learn and I would compare the internship to a full time course load if not more.

RESULTS – SUSTAIN – STUDENT EXPERIENCES

- My experience at Intel has been awesome! I work for the post silicon component verification team for communication devices, specifically the bootcode team. They have already extend my internship until I graduate, which is awesome.

RESULTS – SUSTAIN – STUDENT EXPERIENCES

- I have really enjoyed my internship this summer. It has been very challenging sometimes which is expected. I am learning new things that I would never pick up at school. I really think this experience has been really great.

RESULTS – SUSTAIN – STUDENT EXPERIENCES

- The internship at Intel is going really well. I have a spot with System Validations, I help develop content for the Media and Graphics team; this content is used to validate Ip's on SoC's. I have learned a lot about the command-line interface/Linux, and about using version control such as Git, and about running emulation tests. I frequently use shell scripts, and I use lots of C++. I have learned so many new things in the last two and a half months, a lot of these things i would never have learned had it not been for Intel. I am a micro-nano specializing student, and this has internship has sparked my interest in computer science/engineering.
- There is frequently activities and volunteer opportunities for Interns. I have participated and volunteered several times over the summer such as helping middle school students with micro controller projects, to cleaning up a nature-park. Intern activities range from going to Top Golf, to going kayaking on town lake. The teams we work with also have activities, summer activities like Schlitterbahn, and a Lake Travis Boat Party. This is seriously the best internship I could possibly imagine ever having. Thanks for being a part of making it happen.

RESULTS – SUSTAIN – STUDENT EXPERIENCES

- This internship has really helped me to increase my standard of living. This is because I've been living on a budget and not able to treat myself well for the 2 year plus I am in the United States. This job has help me to be able to buy a car, pay partially for my parent's apt ($500), my own apartment fully, and have around $200 to spend for myself, and other bills. Other than that, I have no longer need to eat Pasta everyday by switching the sauce. Also, the internship has gave us opportunity to network with each other a lot. We have been paid to go to Top Golf, some event in Zilker Park and many more that I've heard that I missed. I've also able to increase my credit card limit now. This opportunity also got me to interact with more experienced people in the industry. Also, I am very glad that they placed me at where I am which is as a System Validation Engineer intern because of my interest that I've told the hiring manager and he actually listen and place me in a relevant department. My manager also took initiative to have 1:1 session with me bi-weekly. Also, I am really excited for the classes that I will be taking because by judging with their course title, it is really relevant to what I am doing right now and will give me a better idea of how things actually work. I think engineers need both theory (knowledge) and hands on experience to excel in this field. I feel that Intel has and will also be able to give me a lot of opportunities in this, present and in the future.

RESULTS – SUSTAIN – STUDENT EXPERIENCES

- Overall, attending the 122nd ASEE Annual Conference & Exposition in Seattle was a highly rewarding and inspiring experience. I was able to amass knowledge and find new perspective in the methodology and tactics utilized by engineering education professionals to make learning interactive and effective, while encouraging higher interest and involvement in the STEM disciplines. I was also able to reaffirm my plan to pursue higher education in the Materials Science Engineering discipline, after attending some of the Materials Engineering Sessions, which served to enhance my interest and passion in the area. During our time off from the conference, Owusu and I were able to explore Seattle, travel, meet old friends, and experience the beauty of Washington by hiking with old friends. I was also able to tour the University of Washington campus with a good friend of mine, and explore Los Angeles during my 4-hour layover at LAX.

- The trip was a fascinating and highly educative experience, and I thank Dr. Aslan and the Ingram School of Engineering for giving me the opportunity to partake in it. I hope to keep learning and growing in the STEM discipline, and give back to the community the same way it has given to me through such experiences.

- Images from the 2015 ASEE Conference, Seattle can be found at the link below: https://goo.gl/photos/ctqMNvhBwbj7HTk67

RESULTS - EMPOWER

- Recruit two cohorts of up to four female and minority students to participate in an Intel internship and workflow pipeline program. The program focuses on a total of eight students. Intel supports up to ten students.
- The first Intel Internship recruitment event was a real success. We had a total of 25 applicants (12 female and 13 male) and filled 11 positions. Most of the students were hired around May. We had a total of:
  - 6 female and 5 male Interns
  - 5 Hispanic, 3 white, 2 African American and 1 Asian interns
  - 10 Interns and 1 full time hire. All interns can continue with this program as interns next year under this program. The full time student will start 1/4/2016.
  - The average salary during this short time was approximately $14,000 per intern (over 10 interns)

Q/A

- Thanks