WiCyS Conference 2017

The Fourth Annual National Women in Cybersecurity Conference (WiCyS) took place in Tucson, Arizona on March 31-April 1, 2017. Nine hundred people registered for the conference (with controlled registration in place), and the event had approximately 785 attendees, which is more than double the number of attendees of the first WiCyS in 2014. The attendees were students, faculty, researchers, and industry professionals. There were 287 organizations represented at the conference. The conference was evaluated by a general survey. In addition, the evaluator both observed the conference and conducted informal interviews of attendees at the conference. The WiCyS Conference has grown every year from 350 attendees in 2014, 475 in 2015, 750 in 2016 and 785 in 2017. WiCyS 2018 conference will be limited to 1000 registered attendees to allow for maximum impact with optimal community size and interaction.

Figure 1: Attendance Over Time

Conference Background

With initial support from National Science Foundation (Award #1303441), WiCyS started in 2014 to bring together women (students/faculty/researchers/professionals/leaders) in cybersecurity from academia, research, industry and government for sharing of knowledge/experience, networking and mentoring. In WiCyS, registration is controlled to allow 50% of expected attendees to be students from 2 and 4 year institutions at all levels of education, 25% of expected attendees to be educators/researchers and the rest industry professionals and recruiters. Workshops, networking and career fair are an integral part of the conference as always with dedicated sessions for academia, research and industry tracks.
Diversity of Attendees

Data was taken from the registration forms about the demographics of the attendees. The data demonstrates that the attendees are from very diverse backgrounds: 49% of attendees were students: 12% were freshmen/sophomore/Associate Degree students, 19% were junior and senior students, 14% were Master’s degree students, 4% were Ph.D. students. Among the rest, 12% faculty, 25% security professionals, and 14% were human resource personnel.

Of the approximately 785 attendees, a total of 243 attendees completed the conference survey for a response rate of 31%. This is a decreased response rate from the previous year, which could be due to the administration of separate surveys in some of the areas. The following information is from those surveys with additional information included from interviews on-site and observations from the conference. The attendees were from different walks of life.

Of those completing the survey, 95% were female and 5% were male. Similarly, the attendees reflected diversity in their race/ethnicity composition. Compared to first year of the conference, the diversity has increased. This year 58% of the attendees were white, 14% black/African American, 22% Asian, 10% Latino/Hispanic, 1% American Indian and 2% Native Hawaiian/Other Pacific Islander.
Of the attendees, 3.9% had attended WiCyS 2014, 13.7% had attended WiCyS 2015, and 22.6% had attended WiCyS 2016, while 69.6% of the attended were attending for the first time. This is an excellent composition with approximately 30% of the attendees coming back for a second year and about 70% of the attendees being first timers.
Coverage of Cost of Attendees

WiCyS covered the cost of lodging for 52% of the respondents, 18% were covered their institutions as sponsoring partners, 23% by their institution, and 7% personally covered their lodging. Attendees were given the opportunity to provide comments related to this question. Of those responding, 27 provided comments to this question.

![Coverage of Lodging](image)

**Figure 5: Coverage of Lodging**

The comments could be broken down into six categories: allowed to attend, want to attend in the future, accolades about conference and/or venue, more rooms requested for conference hotel, alternative coverage, and thanks. Of these responses, 18.5% said that they would not have been able to attend without WiCyS covering lodging, 3.7% want to attend in the future, 22.2% expressed accolades about the conference and/or the venue, 7.4% wanted more rooms at the conference hotel, and 44.4% express gratitude.

![Breakdown of Comments Regarding Lodging Coverage](image)

**Figure 6: Breakdown of Comments Regarding Lodging Coverage**
<table>
<thead>
<tr>
<th>Selected Comments Regarding the Coverage of Lodging</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thank you WiCyS for covering my lodging. Please keep up the good work</td>
</tr>
<tr>
<td>Very grateful for the lodging accommodations. Outstanding view and venue.</td>
</tr>
<tr>
<td>I would not have been able to attend if the expense for lodging was not covered.</td>
</tr>
<tr>
<td>Thank you for your support of Women</td>
</tr>
<tr>
<td>Accommodations were beautiful!</td>
</tr>
<tr>
<td>I stayed outside the hotel. A suggestion would be to block more rooms for the conference attendees.</td>
</tr>
<tr>
<td>Thank you soo much, this would not of been possible if the Wicys project didn't provide me with Lodging. I greatly appreciate it.</td>
</tr>
<tr>
<td>I am very grateful for the opportunity.</td>
</tr>
<tr>
<td>Wicks project covers the lodging, our other nsf grant covers the transportation</td>
</tr>
<tr>
<td>I really appreciate the financial support provided by the WiCyS project. Without it, it would be significantly harder for me to attend the conference and might not be able to attend some. Thank you!</td>
</tr>
<tr>
<td>Thank you for the scholarship. It make me open my eyes to a world of opportunities in the cybersecurity field.</td>
</tr>
<tr>
<td>Please keep sponsoring student attendances.</td>
</tr>
<tr>
<td>I stayed at friends in carefree az.</td>
</tr>
<tr>
<td>Thank you for providing scholarships! This has been a priceless experience, and I wouldn't have been able to attend this life changing conference without the WiCyS attendee scholarship.</td>
</tr>
<tr>
<td>Grant</td>
</tr>
<tr>
<td>The hotel was amazing! Great location.</td>
</tr>
</tbody>
</table>

Of the responding attendees, 59% said their institution covered their travel. The second most frequent response was 30% of the attendees said they personally covered their travel. Seven percent said that their travel was covered by WiCyS Strategic Partners (Facebook, Cisco, Fidelity Investments) and 4% were covered by the WiCyS Project.

![Figure 7: Coverage of Travel](image)
Overall Impact of the Event

The response to WiCyS 2017 was overwhelmingly positive. The first indication of the success of the conference was the growth in the number of attendees. A total of 900 individuals registered for the conference. The conference surpassed the number of contracted rooms at the conference hotel and attendees had to be put up at additional hotels.

Conference Observations and Conference Interviews

The next indication of the success of the conference was from observations at the conference. It was clear that there was a diverse group of attendees based on gender, race/ethnicity, education level, and type of attendee at the conference. Despite the crowds at the conference, all attendees seemed excited and engaged in conference activities as well as networking. Sessions were well attended. People were actively engaging in all interactive activities. Lots of questions were asked at all events from individual sessions to keynotes. Networking was occurring at all possible opportunities from mealtime to the hallways to both formal and informal networking events. There was a line at the resume clinic even though it was extremely well organized. The career and graduate school fair was packed. The poster sessions were well better attended than previous years. Registration was very efficient and an improvement over previous years. One minor issue with the registration was the ribbons for the badges did not stick well and kept falling off. A couple of attendees questioned whether there was an issue with Market Place. It was nice that the food was not served during talks at breakfast. However, attendees still requested more time to network at the other meals.

This year an outside group was added to help with the sponsoring partners for the career fair. One sponsoring partner suggested that Career and graduate school overall seemed very pleased with the event. One state, “I have been to the event every year and it keeps getting better and better”. Another stated that they wanted to save internships specifically for WiCyS. However, two others stated that it would be better if WiCyS was earlier in the year because they had already made their internship decisions by the time of WiCyS. One sponsoring partner requested that all WiCyS emails in the future come from one central location.

Overall most sessions were well attended the audience was engaged. Of particular note, was that Facebook’s session and workshop were filled to overflowing and there was a palpable excitement in the air. Both “Stories from the Battlefield” and “Cryptography Against Physical Attacks” were standing room only. People were very enthusiastic about the Cisco presentation.

Another indication of the success of the conference is from the surveys completed by attendees. Of the attendees completing the survey, 96% rated the overall conference as good to excellent while only 3% rated it fair and two attendees (1%) rated it poor. The most common modal response was excellent with 61% rating it excellent, 26% very good, 8% good, 3% fair and 1% poor.
People were more pleased with the location, conference facilities, and lodging this year over the previous year. This year 68% compared to 56% said the location was excellent. Similarly, 74% compared to 64% said that the conference facilities were excellent. Likewise, 77% compared to 59% said the lodging was excellent. It seems that moving from an airport location as requested last year improved people's perception.

Figure 8: Ratings of Conference Overall

Figure 9: Rating of Excellent for Location, Conference, Facility and Lodging
Overwhelmingly, the attendees felt this was a quality conference. This was reflected in both the surveys and interviews. Of the attendees, 97% found the content to be appropriate. Likewise 96% felt that it was worthwhile.

![Bar chart showing the percentage of attendees who found WiCyS valuable.](chart.png)

**Figure 10: Percentage of Attendees who Found WiCyS Valuable**

WiCyS plays an important role in networking and mentoring. Evidence for this can be found from the surveys and observations at the conference. From onsite interviews with women at the conference and from surveys women completed, they indicated that they wanted even more time to network informally. In particular, attendees requested more time at meals to network. Cybersecurity is a male dominated field and women in the field can often feel isolated. WiCyS plays an important role in reducing this isolation with 96% of the female attendees responding that they felt less isolated as a woman in the field because of WiCyS. Similarly, 97% of the relevant attendees said that they felt a part of the women in cybersecurity community as a result of attending WiCyS. These women found WiCyS to be an excellent networking opportunity with 97% of attendees saying it helped them establish personal and professional contacts. Even more promising is that 95% of all responding attendees planned to keep in touch with people that they met at the conference. This ensures that the conference has more of lasting impact. The women interviewed at the conference appreciated both the opportunity to mentor others and to be the recipient of mentorship that WiCyS provides. Many indicated that they intended to be both a mentor and to find a mentor as a result of attending WiCyS.
Of the attendees responding, 99% found both the keynote sessions and the
distinguished speaker sessions valuable. Of those attending the student poster
session, 95% found it valuable. This compares favorably with the 88% that found it
valuable last year. Those attending the technical presentations and Birds of a Feather
Sessions found them valuable at the rates of 99% and 98% respectively. The panels
were rated valuable by 98%, while 96% rated the Lightning Talks as valuable. The
workshops were found valuable by 98% of the attendees. The Career/Graduate
School Fair was rated valuable by 97%, the Speed Networking/Mentoring by 97%,
and the Resume Clinic by 95% of attendees who attended these events. Finally, 99% of
attendees found the networking socials as valuable and 100% of attendees found
the informal networking opportunities as valuable.

Even though the attendees felt each of these components were valuable. They
did provide feedback to help improve the event next year, both from interviews at the
conference and in the survey. One of the most common suggestions concerned the
issue of the speakers being at the meals. A common recommendation for
improvement was to use the meals (all or in part) as informal networking
opportunities. This would make it both easier to hear the speakers and provide more
time informal networking. Thus, either to have the speakers at a different time or to
start the speaker at dessert was recommended. Similarly, attendees wanted more
time between events to informally network. Attendees wanted more hands on and
interactive sessions overall. Additionally, there were numerous people who
requested more technical sessions. Some attendees requested more diversity (race,
ethnicity, and sexual orientation) of the speakers. It was recommended that you have
different tracks either one for students and professionals or one based upon skill
level.
Other indications of the success of the conference are the percentage of attendees who would recommend the conference to others and the percentage of attendees who plan on attending next year. It is important to note that 86% would definitely recommend, another 8% would probably recommend the conference, 5% would maybe recommend the conference while only 1% (2 people) would not recommend the conference. No one said they would probably not recommend the conference. Another promising finding was that 51% of the attendees definitely plan on definitely attending in 2018 with 21% probably attending, 19% said they maybe attending. Only 7% of the respondents said probably not and only 1% said they definitely were not attending. Many people provided comments in regarding this question. Many indicated that their attendance would be determined by funding, their job, or school status.

Table B:

<table>
<thead>
<tr>
<th>Comments Regarding Attending Next Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>I may be in a job change situation, not sure what the future holds at that time!</td>
</tr>
<tr>
<td>Would love to attend if registration/lodging are covered through a scholarship/grant and airfare is reasonable</td>
</tr>
<tr>
<td>While this was a good conference, I did feel it was more geared towards students and/or graduate students rather than professionals already in the field</td>
</tr>
<tr>
<td>Depends on whether my department is able to find funding in the budget</td>
</tr>
<tr>
<td>I'm planning on studying abroad in London, if not I would love to attend the conference once again!</td>
</tr>
<tr>
<td>I definitely want to attend because I want to learn more from Cybersecurity opportunities and from other women already on the field</td>
</tr>
</tbody>
</table>
I live all the way in California and I am a high school student which means next year I will be a sophomore. If you guys invite me back I will be there.

The conference didn’t strike me as particularly different from last year’s conference. That’s perfectly fine considering your primary target are rising or new grads. Being a professional in the field, however, I’m inclined to go every 2-3 years instead of annually.

Since I’ve attended for the past few years, I plan to give the opportunity to a colleague. Only so many of us can come out and I want her to experience this fantastic conference!”

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**Figure 13: Percentage of Attendees Who Would Recommend the Conference**

- Definitely: 86%
- Probably: 8%
- Maybe: 5%
- Definitely Not: 1%
- Probably Not: 1%

**Figure 14: Percentage of Attendees Who Plan on Attending Next Year**

- Definitely: 52%
- Probably: 19%
- Maybe: 7%
- Probably Not: 1%
- Definitely Not: 21%
Funding was crucial for attendance at the conference as evidenced by both the open ended responses that we received from participants about whether they would attend next year and noting the answers to specific questions about funding and conference attendance. Of those responding, 97% said that the low cost of the subsidized registration enabled them to attend this conference. Similarly, 95% of respondents said that the no cost for housing allowed them to attend the conference. Likewise, 94% said that no cost for meals allowed them to attend the conference. Therefore, each of these components, which limited the cost of the conference for attendees, was essential to the ultimate success of the conference.

![Figure 15: Funding Impact on Attendance](image)

Overall, attendees reported a powerful, pervasive impact of the conference. This was true for all types of attendees: students, educators, and other professionals. In addition to quantitative data, qualitative data was collected from the conference attendees. Their open-ended comments demonstrated that the conference was having a deep impact on individuals and organizations and was impacting them in various ways. When asked “Please share with us how this conference benefited you personally and why it is a worthwhile event/community for funding agencies/sponsoring partners to support”. Note that a few were edited for typos, but none were edited for content.

Table C:

<table>
<thead>
<tr>
<th>Representative Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>I personally benefited from the confidence, companionship and access to the best women in the cybersecurity industry. Inspired to volunteer and help put this conference on for 2018 and beyond.</td>
</tr>
<tr>
<td>The conference allowed me to interact with people in industry and adjust the alignment of my academic efforts with those of industry.</td>
</tr>
</tbody>
</table>
This event really opened my eyes to the opportunities and true life careers I will be able to take on after I graduate. I’m very excited to continue going, both as a student, and once I find my career position. It’s a wonderful way to network.

It benefited me and gave me the confidence that I can pursue a career in Cyber security. It is a great way to connect with other people and learn what is the latest in Cyber security.

The amount of knowledge has better prepared me to understand the importance of security in my career.

I have gotten all kinds of connections and support from this conference - professional, philanthropic. I’ve also kept in touch with many attendees after the fact.

I learned so much and met people that would help mentor me. I took back the experience and ideas with me to my country and have already started implementing some lessons learned by talking to young girls on ways of exceeding in IT and cyber security and how not to give up.

Benefits are numerous and wide reaching for all spectrum's of the cybersecurity community.

This conference helped me to see the bigger picture, greater need for research and workforce development in Cybersecurity. It also gave me a chance to connect with other people in this area. I know about more tools, resources, research areas, entities related to cybersecurity, which has motivated me to continue working in this area.

I learned a lot of available resources which I can use for both research and teaching.

The first year I attended (2016) was really my introduction to security, and I left deadset on learning more. I went back to my university and found we didn’t have any courses combining security and cloud computing, but one of my professors was willing to supervise me for an independent study. That independent study turned into a poster which helped me win the undergraduate category. It’s come full circle in encouraging my interest in security, and now I’ll have the opportunity to use the award money to attend another security conference.

Lets women know that this is not really an all boys club and its worth the inspiration that is infectious to other woman and men too for that matter. It provides employers with bright talent and pathways for students.

It was my first conference and I learned that I am just as important as the men in this field and my ideas and thought are just as important. I also learned that there are so many different jobs/opportunities in this field that I never thought of. I was never going to go to grad school, but I think it’s a possibility for me now.

Although I felt this conference was more focused on students, I think it is incredibly beneficial to women who are studying in the Cyber Security field. It’s worthwhile in that it is educational, empowering, and it allows for networking opportunities for either potential internships and/or other mentors in the field.

I have presented there, been on the review committee, and a sponsor. It has helped me gain greater visibility within the field, and now I bring along my colleagues to provide them greater exposure within the field.
It is said, you don’t know, what you don’t know. I was in a funk before attending the conference. The place I work at is in financial dire straights, and my future here is not looking good. I simply didn't know how GOOD the future could look until I attended the WiCyS conference! I was lifted out of my funk, I was given the gift of hope, and by attending the conference, I was shown how I really could make and find a future in Cyber Security!

It allowed me to see so many other successful women in the field to look up to as potential role models.

It’s gratifying to see so many smart, capable ladies in the cyber security field.

Linked up with experts in cybersecurity industry who can help with our government efforts.

Had it not been for a scholarship from my university, I would not have been able to attend and create so many strong networks with women in similar fields to mine. It was also interesting to learn so many different things from women with various perspectives who come from all walks of life.

This conference provided resources that I can immediately put to use. I am more inspired to teach cyber security to middle school and high school students and encourage them to explore career opportunities in cyber security.

Lately I've been in a bit of a slump as far as my field goes. I constantly felt isolated and unwelcome but this experience made me felt like I'm a part of something bigger.

It is impossible to overstate the importance of mentors and peer networks for the support and retention of individuals interested in cybersecurity. Women often feel isolated in this field. This conference has a direct effect on our likelihood to continue along this career path gaining critical skills for the workforce.

For women attendees it is all about helping us understand we are not alone -- many other women are seeking cybersecurity as their chosen field

What a great opportunity to network with peers from my own business, others across industry, as well as provide mentoring to the amazing group of up and coming talent.

I have held myself back from so many opportunities because I didn't realize what value I had until this conference. This conference gave me the confidence to do so many projects I put on the back burner because I didn't believe I was ready.

After attending WiCyS, I feel more confident about myself. At WiCyS, I presented a poster for my first time in my academic career, and I was announced runner up at the graduate competition! I felt so proud of myself and so eager to keep doing even better at my Ph.D. This feeling of doing something that other people liked, empowered me to continue no matter what and be a more active member of this community.

Investment in the future. Recruiting efforts. Mentoring young women.

I recently found out that I am pregnant. Shortly before that, I was contacted by a recruiter with a great work opportunity. Many told me to stay in my current role due to my situation, but at WiCyS I was able to meet women who went through the same situation as I, took the job, or the promotion, and were happy and successful.
As a result, I am now pursuing this new opportunity. I also enjoyed meeting all the students. They boosted my spirits, impressed me with their own ambitions, and made me feel like I have something to give back to the community. Also, I was struggling with a difficult situation in my current job, fueled by my manager not being upfront with me and not supporting me in a project even though he told me he would. Hearing from other women at the conference who have been in similar situations and hearing their advice helped me gain perspective on my own situation.

The event has really encourage me to self enrich myself just so that I can keep up with those other young talented women in the field.

WiCyS provided me with the motivation to enter and stay in the cybersecurity profession. After attending WiCyS, I decided to pursue a Masters in CS with a focus in Information Assurance and apply for the SFS Cybercorps program. Going to WiCyS each year serves as a confidence boost because I’m able to see all these intelligent women do amazing things and it shows me that I can make it too, even when college gets tough and I feel like I can’t get through it.

The concept behind this vent is fantastic. I loved that it catered to not only getting women into cybersecurity but providing an avenue to the few already in the field.

I found it very motivating to see the brain power and excitement of a large group of people in cyber security. The fact that we were primarily women, succeeding in a primarily-male occupation, added just another bit of spark to that for me.

One of the biggest ways I benefited from WiCyS was that I was able to connect and converse with women from all over the country whose stories were similar to my own. I felt empowered to know that there were so many other women working in cybersecurity who loved the field and made a difference in it. From those connections, I intend to foster mentoring relationships, both as a mentor and a mentee. I’m also motivated now, after attending breakout sessions and hearing about the amazing work other women are doing, to seek new technical skills and to follow my curiosity with more passion and resolve. I’m happy in my current role, but WiCyS opened my eyes to other roles I would love if I developed the skills.

I wasn’t back at work for a week before I had a case that needed me to use some of my learnings on Artificial Intelligence and document classification.

This conference gave me a window into cyber security and helped me find a direction to follow that I’m passionate about. It made me feel supported by all the amazing women who attended, and gave me a large sense of community. It inspired and energized me and made me feel like I could do more than I’d thought I could do before. I got an internship from the career fair which will provide me with invaluable experience.

It’s encouraging women to continue to pursue male-dominant field, and by seeing many successful women in cyber security, it is very inspiring in terms of motivation and determination that I could be as successful as one of those speakers at the event.

This is my top conference. I love it and is one of my motivations to continue in the Cybersecurity field. When I finish my BS I will love that the company where I will
be working, become a sponsor. In that way I will continue helping women’s growth in this field as I did.

This conference helped to reassure that I want to continue my studies in the cyber security field because I felt that there was no support and I wanted to change my field of study because I thought I could not do it.

It has opened up my eyes and actually spurred a project to help those students looking for employment after school and visas are up.

I was able to find some candidates for jobs, some students to mentor, and I was inspired to put together a presentation for next year.

A surprising benefit is being able to tell male colleagues where I’m going which open the door for conversation on the appalling statistics on women in this field & the need to reverse this which may not have been on their radar before.

I was able to get research ideas based on the presentations at the conference. I left feeling very excited about the wealth of knowledge I gained.

This conference was a positive and supportive space to talk about cyber security and the unique challenges and opportunities for women in the field. Without this environment, these frank conversations could not occur. The subsidized cost to students means that a much broader audience of well-qualified students attends, which is excellent for organizations looking to recruit.

It gave me many ideas to bring back to our new cyber security club as well as more confidence in my abilities and myself. I also met some amazing women who have inspired me and I will keep in contact with them as I grow in my own career.

New learning experience. I want to reach out more students, even 9 to 12 grades.

It has helped so many women not feel alone in this field. My current university has no female faculty in the computer science department so it is absolutely wonderful to be surrounded by so many amazing role models.

I was able to network, learn about others jobs, learn about things that can help me as someone graduating soon. I was able to see improvement from last year’s conference in my networking skills. And I left feeling inspired to continue on my chosen path in cyber security. I feel inspired to continue to pursue school/job related goals that will help me to be a valuable person at whatever job I get after graduation.

This conference allowed me not only to network with amazing companies, but also women from all over with different backgrounds!

The connections and conversations are enlightening both as a woman and as a security professional. It’s hard to express in a small box the tremendous benefit I get from this conference. Some technical knowledge, lots of personal growth advice for perfectionist types, often a shared bond of experiences as a woman in tech, and more ideas to keep creating the pipeline of middle/high school girls in cybersecurity.

Connecting with all these women has given me back a sense of self and community that I had lost in the competitive day to day I have to face working with a lot of ego driven, "old boys club" men. I believe that cyberdefense will be more effective if more women were involved in analysis, planning and project management. The
men I work with are introverted isolationists who tend to hoard knowledge and focus on one problem at a time, rather than a continuous and complimentary program driven by business and service needs. I am generally ignored, coddled, given lip service, or distrusted for leadership because I think in terms of holistic complexity and maybe that overwhelms my male colleagues. I have never had the chance to be mentored into a leadership position but I am going to work on that now, and work even harder to change the paradigm. I met people who were willing to be my mentors and have offered me internships in the future.

It was able focus my interests and expose me to ones not covered by my university. Being around women was invigorating! We weren't having to prove ourselves to the boys, each of us stood on our own merit which is the best thing we can learn. It helped me to be more enchanted by security and foresics. I am still studying about the area and looking for how I can improve my skills in the area. The conference was a great opportunity to see how it happens in the real world. It is a worthwhile event because you can deep and really connect educators, professionals and students (the content of the lectures is amazing, but for sure the poster session is the big moment for the students to show their researches). Without all those support from sponsoring partners, how could we get together so great minds, ideas and experiences? Keep doing the good work! Learn more about security and how to get involve with security industry. It also helps me to networking with big company such as Raytheon, Cisco, Facebook, Google and so on.

I have not gotten any exposure to Cybersecurity through my school, so I’m so glad my club organized a group to come here. I left feeling like this is something I might be able to do and without this conference I wouldn’t have even known this field existed.

I brought students and they got a lot out of it and that pleased me. I am not a cybersecurity professional and was able to learn a lot about how the field has grown.

The conference was very encouraging and motivational. It has increased awareness of different career options within the sponsoring partners and how I can learn and prepare myself to be a good fit for the company in the future and what I can offer to those companies.

Having been the only woman in the room for 25 years, it was so inspiring to be in a room FULL of women.

**Educators and Professionals**

Some of the questions on the survey were aimed specifically at the educators and professionals. It was important to evaluate what these educators and professionals were taking away from the conference to help them succeed in field. A total of 97 educators and professional answered the survey. Of the responding educators and professionals, 91% reported that the conference gave them ideas to improve their skill set. This was a new question for the survey. In addition, this year 95% said that the conference gave them ideals to share with their colleagues back home compared with 91.0% who reported that the conference gave them ideas to
share with their colleagues back home last year. Similarly this year 98% reported that the conference helped them face work with renewed enthusiasm compared to 96% who last year said that the conference helped them face work with renewed enthusiasm. Likewise, 99% of responding attendees this year said that the conference helped them feel more connected to others in the field compared to 96% agreed that the conference helped them feel more connected to others in the field last year. In addition, 98% reported that the conference has had a positive impact on their professional development this year compared to 93% who reported that the conference had a positive impact on their professional development last year. Overall, there was a positive trend in the responses on the survey for this group.

![Figure 16: Impact of the Conference on Educators and Professionals](image)

**Students**

Some of the activities at the conference were specifically aimed at a student audience such as the student poster session, resume clinic, the career/graduate school fair. Students were very pleased with these activities; 95% found the poster session valuable, 95% found the resume clinic to be valuable, 99% found the career/graduate school fair to be valuable, and 97% found the speed networking/mentoring to be valuable.
Since the impact on students was a crucial component of the workshop, a separate part of the survey was answered only by students. A total of 137 students completed the survey. This section of the survey deals with issues related to the conference’s impact on students’ commitment to current degree and commitment to career in computer security. Of the responding students, 96% said that the conference increased their commitment to complete their current degree program and 96% reported the conference increased their commitment to pursue a career related to information/computer/cybersecurity.
The conference also helped 98% of students learn about academic programs in information/computer/cybersecurity. Of the responding students, 92% of students reported that the conference increased their intention to pursue an undergraduate or graduate degree in a related field. This is down from 98% the previous year.

The conference provided opportunities for students to increase their knowledge of career opportunities, confidence in their abilities, and interest in pursuing a career in the field. An increase awareness of job opportunities in security was reported by 98% of the students. Many women leave the field because of their lack of confidence. The conference worked to improve the confidence level of students and succeeded with 95% of students reporting an increase in confidence in their ability to succeed in a job in information/computer/cybersecurity. Importantly, 96% of the students reported an increased interest in information/computer/cybersecurity.

**Strengths of the Conference**

When attendees were asked to write a single word that best described their personal feelings after attending the conference, their words were overwhelmingly positive. While last the four most frequent responses were recorded, this year the top seven were selected because four words tied for fourth place. The four most frequent responses were inspired, motivated, empowered, and excited. Interestingly, top four words this year were the same as last year's top four words. Three of the four top words were in the list of top four words the previous year. Empowered moved from fourth to third place this year. The consistency of the top four words from year to year is remarkable. It is interesting that empowered moved up on the list each of the two previous years. One of the most valuable parts of the conference from the perspective of the interviewees was inspirational and motivational spirit of the conference. This is important for both getting underrepresented minorities into the cyber and field and then keeping them in the field.

**Table D:**

<table>
<thead>
<tr>
<th>Most Popular Feelings about the Conference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Inspired (22.22%)</td>
</tr>
<tr>
<td>2. Motivated (8.7%)</td>
</tr>
<tr>
<td>3. Empowered (7.25%)</td>
</tr>
<tr>
<td>4. Excited (3.38%)</td>
</tr>
</tbody>
</table>

**Feedback from Last Year Incorporated Into WiCyS 2017**

Several items from last year's feedback were used to improve this year's conference: (1) Non-airport venue (2) More networking time (3) An interactive App for the conference (4) Special option for companies able to distribute information at the conference.
Each of these changes made a positive contribution to the conference. The social networking opportunity with sponsoring partners was one of the highlights of the conference for many of the attendees, for example.

**Useful Recommendations from Surveys**

Many participants shared useful recommendations for next year’s conference in the form of interviews and from the surveys.

**Table E**

<table>
<thead>
<tr>
<th>Useful Recommendations for Next Year’s Conference</th>
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</thead>
<tbody>
<tr>
<td>Hands-on activities/workshops are the most beneficial</td>
</tr>
<tr>
<td>Wait until meals are over/closer to the end before speakers begin. While in the large rooms, have video of the presenter on a screen- hard to see from the back.</td>
</tr>
<tr>
<td>We would like to see more research content in the conference that is stimulating for graduate students and researchers. We propose to have a PhD Student Workshop where they can present their research work and get feedback.</td>
</tr>
<tr>
<td>More engagement from funding agencies (what areas they like to fund) would be helpful.</td>
</tr>
<tr>
<td>The female leadership journeys are so inspiring. I liked the Government leaders in 2016 in some of the workshops.I think if we could put more packets together with information on how we can help junior highschool girls get the mindset of college , I think we need to get them there first before highschool to plant the seed. Also let them know that the government as a way to get there. Especially if they are first generation college and thinking degrees are not possible for them. NSF speakers would be great. Government Leaders. Information on cyber clubs for younger girls.</td>
</tr>
<tr>
<td>Again, I thought this was a good conference. It was wonderful in that the keynote speakers and different presenters really tried to empower and encourage their listeners to keep learning and moving forward in their field. However, I did feel this conference was geared more towards students/graduate students rather than professionals. I would suggest either making this clearer on the website and/or expanding the career fair/ technical presentations / activities to branch out and focus more on professionals who are already in the field as well.</td>
</tr>
<tr>
<td>I would have liked to seen more non profit associations like ISSA.org, ISACA.org, AITP or ISC2. These type of associations provide networking opportunities at a local level where the students are located. Connections are important.</td>
</tr>
<tr>
<td>All emails from a central location.</td>
</tr>
<tr>
<td>Some sessions had more people than registered and were standing room only. Be careful that when sessions are full, only those who registered attend.</td>
</tr>
<tr>
<td>Consider getting a professional event coordinator.</td>
</tr>
<tr>
<td>Make sure ribbons stick to badges.</td>
</tr>
<tr>
<td>I know that the budget was quite small, but having water stations would have been really helpful.</td>
</tr>
</tbody>
</table>
WiSys App should allow for Breakout session registration, confirmation and session admission and correctly align with iPhone time. Selected candidates should receive 1 email indicating why they were selected and what their responsibilities will be during attendance. There were emails that were confusing and conflicting in regards to time commitments of other events.

Have a session for those with no cybersecurity background/knowledge about what it is generally and what opportunities it can bring.

More time between sessions.

Keep conference size manageable.

More time between sessions, to allow time to meet the speakers and flesh out my session notes. I did not get to speak to presenters that I wanted to because the lines were too long for the brief time between sessions. I left the conference with lots of notes but hours of editing ahead of me to make sense of them before I forget what was presented. Also I *hated* being required to put/use an app on my phone in order to participate in the conference.

Have you considered having student(s) on your board to help create content for the conference? Maybe one or two could apply per year to participate?

Towards the end of the conference, I noticed lots of people had left before the meal. In the end I saw so many food getting wasted. Perhaps next event, people can say whether or not they will stay for how long so that the kitchen can prepare the right amount of food.

I would recommend going forward that information on the sponsoring partners and the positions they are hiring for, be provided to the candidates before the conference starts so that the candidates can be better prepared.

More snacks and/or larger meals.

Would love to see more social media options that younger generations use - Instagram and maybe Twitter? Many of the younger generation are not on Facebook.

If workshop sessions have open space, unregistered attendees should be permitted to join.

More informal time to talk and get to know other attendees, especially at meals.

The Whova app is not a very privacy protected app. Could you consider not to use it next year?

More diversity in speakers.

More technical presentations.

Some of the most common suggestions were the following: (1) Do not have keynote addresses for the entire meal time; (2) Have more technical talks; (3) Have more hands-on workshops; (4) Allow more time between session; (5) Have more diversity in speakers; and (6) More food either at meal time or snacks between meals. Next year we will address some of these however, some cannot be addressed as they are part of the WiCyS conference design.
Summary

Overall this was an immensely successful conference. The conference was evaluated by personal observations of the evaluator, interviews, and a survey of participants. All indications are that participants found the conference well organized, meaningful, engaging, and a great networking opportunity. Participants’ individual needs were accommodated.

Intellectual Merit

From evaluation, the conference was perceived as well organized, well conceived and addressed an important need. Cybersecurity is a growing field in which women are drastically underrepresented. The conference provided an opportunity for students, educators, and professionals in this field to both network and to develop new skills.

Broader Impact

The conference meets several criterion of broader impact. The conference provided learning and mentoring opportunities for high school students, college students, graduate students and postdoctoral students, as well as junior faculty. It stimulated the interest of students in research experiences and provided a professional development opportunity for computer science teachers. It broadened the participation of women and minorities in computer security through both recruiting new women and minorities into the field and helped to maintain those already in the pipeline through support and mentoring systems. The conference helped to enhance the infrastructure for research and education by establishing collaborations between researchers in industry and academic institutions. The conference also provided an opportunity for other NSF projects to broaden their dissemination to teachers and industry. Through strengthening the pipeline for computer security the conference also provides benefits to society by enhancing national security through strengthening cybersecurity.