

IEEE Women in Engineering WIE ESPE Affinity Group

IEEE Universidad de las Fuerzas Armadas ESPE Student Branch
Ecuador Section

Presentation



Figure 1- Members of the Affinity group IEEE ESPE Student Branch on the Hackathon connected Campus.

The Affinity group WIE IEEE ESPE was formed on April 2018. Since the creation of the Affinity group the members and volunteers dedicated themselves to enforce the main objectives of the Affinity group, which are motivation and

retention of women in engineering. Currently the Affinity group consists of its advisor Ing. Andrea López and coordinator Michelle Herrera, and 31 WIE members and 20 additional volunteers. The group's potential to work on technological projects of a social nature and commitment to society are evidenced in the execution of the activities and events of the year 2019. This encourages the actual Affinity group organization to keep going on the same line and innovation during this period.

Despite the actual pandemic the Affinity group have not stop working, and have joined forces with seven Affinity Groups of the country and two student sections that belongs to ASME (The American Society of Mechanical Engineers), to work together through this times and offer quality events to university community, girls, boys, women and men. All this organization is based on a strong strategic planning that was made at the beginning of the year, highlighting our vision, to be recognized regionally as an exemplary Affinity Group 2020.

Institutional organization

WIE Affinity Group of the IEEE Student Branch - ESPE, is a group conformed by IEEE volunteers representing “Universidad de las Fuerzas Armadas ESPE” dedicated to promoting, incentivizing and inspiring women become involved in technical careers and maintain academic interests within the fields of engineering and science.

The objectives of the organization are strongly aligned to those maintained by the global network IEEE Women in Engineering (WIE), which are:

- Facilitate the development of programs and activities that promote the involvement and retention of women in engineering programs [1].
- Guide young women in middle and high schools through the world of science and technology [2].
- Ensure the continuity of the WIE Affinity Group at “Universidad de las Fuerzas Armadas” [2].

Based on the aforementioned, IEEE WIE ESPE has created spaces for the exchange of ideas and experiences with various women from different fields of technology

in the professional field [2] to promote technological development and retain women in engineering programs, motivating them with conferences, workshops and open chat forums with participation of professional and expert researchers.

WIE affinity group is led by a coordinator [2], and also has the voluntary collaboration of the internal committees for advertising, organization, planning and dissemination of the IEEE ESPE Student Branch. The responsibilities of each position are generalized in such a way: Coordinator is the representative of the affinity group WIE ESPE, advertising committee makes the posters for the events, organization committee is in charge of the logistics area of the event, the planning committee creates the agenda for the events and the dissemination committee carries out the dissemination and communication of the activities organized for the public.



Figure 2. Organization of the affinity group WIE of the Student Branch IEEE - ESPE. [3]

Being an organization fundamentally made up of volunteers, the ideas and contributions of all the members of the Student Branch IEEE - ESPE are considered; therefore, through an assembly with the current board of directors of the Student Branch, the most feasible proposals are determined and for those that are not, feedbacks are made to rethink them and present them again so as not to miss any opportunity to meet the objectives from WIE IEEE - ESPE [2].



Figure 3. WIE IEEE - ESPE Affinity Group Event Planning and Approval Process. [3]

Additionally, as seen in Figure 2, the coordinator has the capability to designate the activities required in the events, according to the availability of volunteers. Figure 4. shows pre-established activities that are essential for an effective development of every event.



Figure 4. Basic preset activities for the development of WIE IEEE - ESPE events. [4]

Documentation strategies for activities

Within the affinity group, following the volunteer mechanics for different activities, the coordinator distributes the work properly for each committee and member to fulfill relevant duties for the initiatives, events, and other documentation responsibilities of the affinity group to promote teamwork and involvement of volunteers.

From each established meeting, the respective evidence collection is carried

permission open for the designated volunteers to carry out the different documentation activities in order.

Considering that the rotation of members within an affinity group is continuous, the format of minutes and activity reports is standardized. This strategy aims to keep the events properly documented to be considered for future directives as an example of inspiration or replication in future projects.

Internal communication strategies and member integration

One of the most important activities of the affinity group, is to socialize and communicate to all the members of the organization during the IEEE ESPE Student Branch and WIE meetings about the events, projects, contests and more activities that are planned. The platforms that are used in a conventional way is email, for invitations and activities that require more formality to enhance events.

A dedicated WhatsApp group is used for informal, but faster communication, and greater interaction among members. This medium is used to inform about the meetings that will be held, to promote the link for virtual meetings, send the premises of organized events to encourage collaboration, suggestions, dissemination of information and exchange of ideas.



As can be seen in Figure 5, the minutes detail the organizational unit, date, place, objective of the meeting, the attendees, the topics discussed and agreements or conclusions reached, in addition to an upcoming meeting date to record the continuous work carried out by the affinity group WIE IEEE - ESPE. These documents allow to establish a strong foundation for the upcoming events starting point. This also enables that, during the course of its implementation, the changes or improvements are minor and that processes comply with the timeline set at the beginning of all the projects.

The platform used by the organization is Drive, due to its ease of use and cloud storage, keeping the editing



Figure 6. WhatsApp group WIE IEEE - ESPE.

Along with the aforementioned, the Discord platform, which can be seen in Figure 7, is used for virtual meetings held with the IEEE - ESPE Student Branch. It might also be used for workshops, contests and benefit talks for the dissemination of technological information for both members as well as the general public.

Training of volunteers

Volunteers within the affinity group have the chance to collaborate in the sub-committees mentioned in the Institutional Organization section. In order to improve and encourage their participation, volunteers are trained in each committee competence areas to develop the required technical and soft skills that will be useful later in their professional careers. For each committee, a member of the Executive Committee and the WIE chapter directive is in charge of keeping track with this training period to properly address the needs of the student members. An example of the diffusion committee training through the discord platform at the beginning of the academic period is shown in Figure 7 and in Figure 8 the schedule and topics from this workshop.

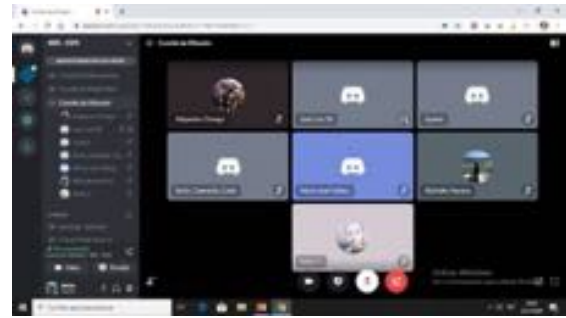


Figure 7. Diffusion Committee workshop for volunteers. [6]

WIE members also have the opportunity to freely participate in conferences and workshops developed by the affinity group. As most of the events include a special guest and professional, members have the chance to ask the necessary questions to increase their involvement in the group as well as their knowledge.

Actividad	Descripción	Duración
Reunión de Inicio	Reunión de inicio del comité de difusión para presentar el plan de trabajo y los roles de cada miembro.	10 min
Taller de Difusión	Taller de difusión para enseñar a los miembros cómo utilizar las redes sociales y los canales de difusión.	20 min
Campaña de Difusión	Campaña de difusión para promover los eventos del comité de difusión.	10 min
Taller de Difusión	Taller de difusión para enseñar a los miembros cómo utilizar las redes sociales y los canales de difusión.	20 min
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Taller de Difusión	Taller de difusión para enseñar a los miembros cómo utilizar las redes sociales y los canales de difusión.	20 min

Figure 8. Schedule Diffusion Committee workshop for volunteers.

Achievement and administration of funds

The events of the Affinity group are self-managed through their contributions or by management in conjunction with the rest of the Student branch and contributions in paid Chapter events.

During 2019 the affinity group obtained the sponsorship of the Ecuadorian Ministry of Education to carry out the event "Día de las niñas en las TICS", the event with the greatest impact of the Affinity group. In each period, the student branch allocates a budget of 135.00 USD for the Affinity Group WIE ESPE, because it is an

association that organizes free events, open to the general public, to promote its noble cause.[7]. Registration for each contest or event is always free, in case of contests, the winners of each category obtain physical prizes of a certain monetary value, as shown in table 1. The Affinity group manages its resources based on the previously planned annual events.

Table 1.- Awards on “Iron kids” event. [8]

	Age	First winner	Second winner	Third winner
Kids	8-12	USD 19.98	USD 15.40	USD 10.00
Teen	13-18	USD 20.00	-	-
Young	Older than 18	USD 19.39	-	-
Total	USD 84.77			

Expenses are tried to be kept to a minimum, for this reason, to cover only necessary expenses for exhibitors or the “vulnerable” public to whom the events are directed, the idea is that they get involved and find out about the affinity group's objectives.

Planning of activities

The affinity group at the beginning of the year make a strategic plan and an annual schedule, for its realization the Affinity group make a meeting with the general directive, last period directive, Student Branch advisor and Affinity Group advisor. Once these documents are approved after a long and rigorous discussion, the coordinator of the Affinity group, let the members and volunteers know how is the year planned, the activities to socialize it, listen to new ideas, opinions about the strategic plan and activities. So, is planned to make the assignation of

committees to start working with the closest event coming. [4] In figure 9 is shown an annual schedule on Google Calendar, this is an easy way for every member and volunteer to be aware of what its coming so they can organize their time to be ready to help the Affinity group in the organization and ejection of the events.



Figure 9. Schedule June 2020 for activities of WIE IEEE ESPE. [9]

For every event there is a planning or Agenda of the same, where is explain and specify what will take place during the event. In Figure 10, is shown the Agenda for the event about Girls in ICT Day.

CodeCombat Day			
Sponsored by: IEEE			
Actividad	Descripción de la actividad	Responsable	Horario
Actividad de inicio	Presentación de la actividad y de la competencia	Proyecto/Grupo	11:00 - 11:30
Charla por parte de estudiantes de ingeniería	Charla sobre la importancia de la ingeniería y la tecnología en la vida diaria	Proyecto/Grupo	11:30 - 12:00
Actividad principal	Participación en la competencia de programación	Proyecto/Grupo	12:00 - 13:00
Charla de cierre	Charla sobre la importancia de la ingeniería y la tecnología en la vida diaria	Proyecto/Grupo	13:00 - 13:30
Charla de cierre	Charla sobre la importancia de la ingeniería y la tecnología en la vida diaria	Proyecto/Grupo	13:30 - 14:00

Figure 10. Agenda of Girls in ICT Day. [10]

External communication strategies

For every activity, the Affinity group use the Student Branch social media (@ESPE.IEEE) on Facebook and (@ieeespe) on Instagram (Figure 11), also every volunteer shares the flyer on their own accounts. To maintain the high rating and attention of the followers and not disperse them, the affinity group uses the branch's social resources, in general, to socialize/promote its activities. Such a

decision allows the affinity group to have a great scope.



Figure 11. Post on Instagram of the event WIE Science Quiz. [11]

The affinity group have a web site where is shared the activities that the members, volunteers and in general the affinity group make, learn more about the objectives, mission and vision, and highlight the benefits of being a WIE member.



Figure 12. WIE IEEE ESPE web site. [12]

Also, the affinity group use vTools to share the upcoming activities to a national and international audition.




Figure 13. Iron kids event shared on vTools [13]

Development of projects and activities



In the next tables 3 and 4, is shown the activities that the Affinity group take place on 2019 to June 2020 respectively.

Table 3.- Summary of activities organized on 2019 by WIE-ESPE affinity group of student Branch IEEE-ESPE. [14]

ACTIVITIES 2019		
2019 Period	 <p>Figure 14. Collage about the International Day of Girls in ICT with the assistants of this event. [15]</p>	
	Event	International Day of Girls in ICT.
	Description	Workshop for children of an Institution about robotics, sensors and technology. Memories made by the members of the Branch are delivered using electronic elements

2019 Period		such as resistors, capacitors, etc.
	Objectives and Impact	Awake the interest in technology in girls and motive them for a future profession like Engineering or ICT.
	Beneficiaries	Girls and boys from a school selected by the Education Ministry of Ecuador. Totally it was 40 students between 11 and 14 years old.
	 <p>Figure 15. Members and volunteers in the Clubs festival of the University ESPE, explaining to the students about WIE.</p>	
	Event	Clubs Festival
2019 Period	Description	Dynamics of presentation to University students about WIE.
	Objectives and Impact	Let the students of the University what the Student Branch do and what WIE do in general about our objectives like Affinity group.
	Beneficiaries	Students from the University ESPE and member, volunteers from the Student Branch.



2019 Period	 <p>Figure 16. Members of WIE presenting ideas and interactive games in Hackathon.</p>	
	Event	Hackathon connected campus.
	Description	A stand dedicated to WIE ESPE was set up with interactive games and ideas presentation
	Objectives and Impact	Motivate Student for join us as WIE and the Student branch by showing them interactive games and ideas the Affinity Group have for the future.
2019 Period	Beneficiaries	Students from the University ESPE and members, volunteers from the Student Branch.
	 <p>Figure 17. Beneficiaries from the robotics workshops.</p>	
	Event	WIE representatives for RAS TT workshops.
	Description	Two WIE-RAS members of the Branch, participated as volunteers in the RAS Ecuador project called RAS TT, giving

		robotics workshops to primary school children.
	Objectives and Impact	Show to children's how easy can be learn about robotics explaining them the fundamentals of the thematic.
	Beneficiaries	Primary school children and WIE-RAS members.
October 2019	 <p>Figure 18. IEEE Members of ESPE, USFQ, EPN, UPSQ Student Branches, celebrating de IEEE DAY with Paintball and bubble ball.</p>	
	Event	IEEE DAY 2019
	Description	Different Student Branches from Quito University's organized a Paintball and bubble ball celebrating the IEEE DAY.
	Objectives and Impact	Commemorate the IEEE DAY and make feel proud to the members of being part of IEEE.
	Beneficiaries	WIE and Student Branch IEEE ESPE Members.
November 2019	 <p>Figure 19. RAS – WIE Member with the IEEE DL guest.</p>	
	Event	V IEEE RAS ESPE Conference Cycle.

	Description	A joint event is set up between WIE and RAS. A series of conferences where the main guest is a professional from the IEEE DL program.
	Objectives and Impact	The conference given by the DL inspire to the students that participate of the event, specially to woman's.
	Beneficiaries	50 Students from the University ESPE and 5 members, 10 volunteers from the Student Branch.

Table 4.- Summary of activities organized until June 2020 by WIE-ESPE affinity group of student Branch IEEE-ESPE.

ACTIVITIES 2020		
April 2020	 <p>Figure 20. Collage about the International Day of Girls in ICT with the assistants to the webinar. [16]</p>	
	Event	International Day of Girls in ICT webinar.
	Description	An academic conference given by a PHD in Ambient Engineering, motivational talks by WIE members and a workshop about programming in Python by interactive games was given to audience.
	Objectives and Impact	Motivate to the youngest, specially girls, to venture into Engineering, Science and technology, especially in moments like this that the world is passing thought a pandemic.

	Beneficiaries	Totally it was 27 assistants to the webinar between kids, young and grown up people.
May 2020	 <p>Figure 21. Covito19 Robot design by Juliana Llerena participant of Iron Kids. [17]</p>	
	Event	Iron Kids
	Description	A new joint event between RAS and WIE is given like a contest to build a Robot with recycled materials to celebrate Children's day.
	Objectives and Impact	Reuse materials to create an innovator design of a robot and expand limits of imagination and creativity of the participants whatever it ages. "Let get out your intern kid" Slogan from Iron Kids. This event had an international impact since there were two participants from Colombia.
	Beneficiaries	Totally 12 participants of the contest between 6 and 24 years old.
May 2020	 <p>Figure 22. Flyer about the diffusion and publicity of the course.</p>	

June 2020	Event	Robotic Builder, Arduino.
	Description	RAS-WIE of ESPE, UPSC, EPL, UTN Student Branches and Affinity Groups organized courses to teach how to build your own robot being from the bases like Arduino.
	Objectives and Impact	Offer to young students the opportunity to learn the backgrounds to build their own Robot online taking advantage in this pandemics times.
	Beneficiaries	Students from different University's, totally the course have had 99 assistants.
June 2020	 <p>Figure 23. Collage about the execution on Discord and lives broadcast on Facebook of WIE Science Quiz. [18]</p>	
	Event	WIE Science Quiz.
	Description	IEEE WIE ESPE with the Student Section ASME ESPE and IEEE USQF Student Branch with ASME USQF worked together to bring a Quiz about women's in Engineering and Science in Discord platform and Quizizz App.
	Objectives and Impact	Offer recognition to women in engineering over time and actually in different fields such as

of this new association is giving positive results because Affinity groups still working together for future events that are planned.



Figure 26- WIE's Party meeting organized by WIE Ecuador Section and Affinity groups of different Student Branches.

Finally, the affinity group make associations with the Robotics and Automation Society (RAS) of Student Branch, to offer the student community courses like Arduino programming. The affinity group and the technical chapter, still working together to offer more courses with the participation of Woman's to give the class on future courses like Robot follower.

Participation of IEEE events and contests

The Affinity Group has participated in events organized by Ecuador section and Sac Team Ecuador.

- Branch Fair RNR 2019
- Managers Workshop 2020 (Home edition) by SAC Team Ecuador.
- WIE Ecuador Meeting 2020 organized by SAC Team Ecuador.

The National Student Branch Meeting - RNR 2019 took place on September the days 19,20 and 21. The Affinity group actively participate to make known nationally and share the Affinity group goals.



Figure 27- WIE members and volunteers participating on Branch Fair RNR 2019.

The Affinity group coordinator and other members from the Student Branch directive 2020, participated on the Ecuador Section SAC Leadership Workshop, where the assistants can learn how to manage correctly Vtools, the branding of IEEE and WIE, determining the roles that each member of the directive has and more.

After the Leadership Workshop, SAC Team Ecuador, organized new and more personalized workshop with every technical chapter and affinity group. WIE ESPE participates actively on this workshop, asking how the affinity group can get funds from IEEE to make bigger events that includes child's, girls, boys and younger people. In this meeting is where the affinity group decide to participate in collaboration with WIE Ecuador to celebrating women's day in engineering.

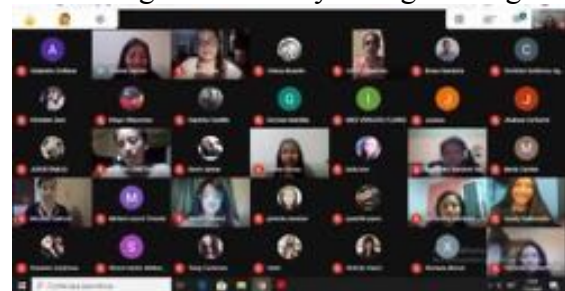


Figure 28- WIE members and volunteers participating on WIEs workshop 2020.

Membership incentive

The first way the affinity group incentive to new members join to WIE is explained that WIE membership is totally

free. Other way of incentive to get membership is giving scholarships to our members to participate on courses given by some of the associations the Student Branch has, like the association that IEEE ESPE has with Bootcamp A.I.

Let volunteers know that they could apply to the scholarships that “Universidad de las Fuerzas Armadas ESPE” grants to members of the Student Branch, as it is legally recognized as a Student club.

In every event the affinity group make is always shown to the assistants the benefits they could have being part of the Student Branch and of course of the Affinity Group.



Figure 29- Presentation about benefits of having a WIE membership.

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