FIRST® Robotics Competition
Effective Mentoring

Contents

1   Overview of *FIRST*® Robotics Competition

Teams of students are challenged to design, build, and program industrial-size robots and compete for awards, while they also create a team identity, raise funds, hone teamwork skills, and advance respect and appreciation for STEM within the local community. Volunteer professional mentors lend their time and talents to guide each team. It's as close to real-world engineering as a student can get. *FIRST* programs gain access to education and career discovery opportunities, connections to exclusive scholarships and employers, and a place in the *FIRST* community for life.

Please visit our Vision and Mission webpage for more information about *FIRST* and our core values.

2   The Mentor Role

Mentoring is an important part of the *FIRST* program and largely contributes to the program's success. This document will focus on information to help all mentor(s) be successful and help their students have the best experience. If you are interested in learning more details about how the season works and getting a better understanding of *FIRST* Robotics Competition, check out the Guide to Running a *FIRST* Robotics Competition Team.

Every adult on a *FIRST* team is a mentor, simply because they lead through guidance and example. It is important to remember students need guidance, structure, encouragement, and most of all, a fun experience! When done correctly, this learning process builds and expands team members' self-confidence and knowledge. If the process has a strong foundation and works properly, mentors come away with as much as students do.

A mentor:

- requires no special skills, but should have patience, dedication, and a willingness to learn alongside the team.
- is any person who works with the team in their area of expertise, for as little as one team meeting or as many as all of them.
- helps provide valuable support and serves as a resource in their own area of specialty.
- may direct the process the team follows to solve the yearly game challenge, without providing the solution themselves.
- is a coach, teacher, motivator, and/or facilitator.
- helps students gain the skills and confidence to forge ahead and build their future with *FIRST*.

- helps ignite curiosity, empower, and guide the collective skills needed to make a positive impact on each other, and the world.

In *FIRST*, it is important that mentors and students are equal, and that the relationship is a partnership. Each person works collaboratively towards a mutual and beneficial goal. To succeed, all the mentors and team members must commit to this.

A mentor's role may include the following but note that not all mentors have to fill every role listed below:

- inspiring students in science and technology.
- actively sharing knowledge and experience with the teams to help foster intellectual growth.
- motivating and engaging students in meaningful activities.
- balancing effective work habits with FUN!
- encouraging the team to welcome and include all members.
- providing students with opportunities to make choices, both good and bad.
- encouraging students to take risks and be inventive.
- allowing and encouraging independent thought.
- creating, encouraging, and facilitating open, honest communication within the team.
- fostering a reciprocal environment of trust and respect for every member and their ideas.
- encouraging accountability within the team.
- facilitating team activities and discussion.
- developing roles within the team.
- coordinating help.
- maintaining equipment and purchasing supplies.
- communicating with sponsor organizations.
- registering for competition(s).
- planning and scheduling meetings, visits, and trips.
- acting as a liaison between team members, mentors, parents, and volunteers.
- being a champion for *Gracious Professionalism*® and role modeling the principle within the team

3   Effective Mentoring

Mentors differ in the amount of instruction they give their teams. Some give very little, and others give much more, and it is up to you and the other mentors to decide which approach is best for your team. If you are a new mentor on a team, consult the Lead Mentor(s) for best practices.

An effective mentor demonstrates the value of success they have encountered during their career path and uses these skills and successes to share knowledge and values with team members. Successful mentoring may help optimize everyone's learning experiences by:

- Promoting independent thought
- Fostering a reciprocal foundation of trust and respect
- Opening communication within the team
- Encouraging effective facilitation
- Promote an Inclusive Environment

3.1   Promote Independent Thought

The following may help you to promote independent thought on your team:

- Approach problems with an open mind
- Treat all ideas as equal
- Ensure all students have equal opportunity to offer their thoughts
- Resist any impulse to judge ideas
- Capture ideas as stated

- Use creative problem-solving strategies to move beyond conventional solutions.

3.2   Foster Reciprocal Trust and Respect

It can be crucial to develop an environment of trust and respect between all team members and mentors to establish a place where are all welcome and excited to learn. Communication is a key component for building trust and respect. The foundation for this type of relationship begins when mentors become approachable and available to students. Facilitate in such a way that the students feel very much a part of the "thinking, contributing, and doing" processes for the team. The mentor/student relationship is based on common goals and continues to build on mutual trust and respect.

Many teams hold team-building events and other activities prior to Kickoff, so new team members can get to know everyone in a fun and non-chaotic environment. These team-building activities may help teams create healthy, working relationships amongst one another.

3.3   Facilitation Techniques

Resist doing most of the talking even if you know the correct answers. When communication is "one way" and the mentor has all of the answers, the other team members will not feel valued. To break through this challenge, learn to be an active listener.

- Encourage open communication.
- Ask open-ended questions such as "What do you think?" or "How do you think we should approach this?"
- Stay away from questions that require a simple yes or no answer.
- Don't jump in with your idea for the solution. Let the team member finish their thought.
- Take the time to make sure everyone understands
- Encourage them to ask questions when you see that something is not clear.
- Always ask if there is anyone who does not understand, and clarify discussions when there is a topic that some students don't "get" or there is a word used that has multiple meanings. The student may not have covered the topic in school yet.
- The effective mentor will pay close attention to what and how something is said. Try to eliminate frustration by letting the team member talk it out.

3.4   Promoting an Inclusive Environment

Part of your role as a mentor is to be an example and to welcome and include all team members. *FIRST* is committed to fostering, cultivating and preserving a culture of equity, diversity, and inclusion. We ask that all mentors take our complimentary, three-part training module course titled Strategies for Inspiring Success for All. These modules will equip mentors with specific strategies to support community outreach, student participation, motivation, engagement, and success through engaging and reflective activities on interactions with students. *FIRST* recommends mentors take this training when they first start engaging as a team mentor. It is also recommended that mentors retake this training on an annual basis to refresh on the tools and strategies provided to best work with all students.

FIRST teams should be mindful of being inclusive to all team members which includes being cognizant of their backgrounds including but not limited to: their pronouns, sexual orientation, cultural norms, and more. To learn more about understanding gender identity terms teams can check out NPR's Guide to Gender Identity Terms.

For additional resources visit the Equity, Diversity, and Inclusion Training & Resources webpage to find links to other resources for increasing your knowledge and practice on creating inclusive environments for all.

3.5   Advice for Mentors

Mentoring a team can be one of the most rewarding experiences in a person's life. Like any great reward, it involves a commitment of time and energy. However, it should not be taken too seriously! The goal of *FIRST* Robotics Competition is to help students have fun with robots while they become comfortable with technology. Whether or not the team is successful at a competition, team members win just by participating.

It is important for every adult to remember that there are responsibilities that come with the adult/student relationship. Young people look up to people they trust and respect and will look to mentors as role models. A mentor's actions will be closely watched, and their behavior will be perceived as appropriate. Be intentional and conscientious in your behavior and language.

Prior to meeting with students, have a meeting with all mentors to set expectations. This can give adults an opportunity to ask questions they may not want to ask in front of the students, openly discuss topics such as diversity, and discuss ideas and potential problems or concerns about working with young people. If this is a school-affiliated team and the school district has an individual who works with school or business partnerships, they should be invited to this meeting to help answer questions.

3.6   Mentoring Tips

- If there is a problem within the team, allow the team to communicate its frustration, decide on a course of action, and then help them move forward
- Resist taking sides
- Keep the group focused
- Be an alert and active listener
- Include everyone. Bring quiet team members into the discussion and keep those who feel comfortable with communication from monopolizing the conversation
- Encourage members to build on ideas
- Respect all ideas
- Allow people to disagree with or challenge an idea, but not to judge the individual
- Record ideas
- Avoid rehash
- Encourage laughter