REC Foundation Student-Centered Policy

Student-Centered

The Robotics Education & Competition (REC) Foundation's mission is to increase student interest and involvement in science, technology, engineering, and mathematics (STEM) by engaging students in hands-on, affordable, and sustainable robotics engineering programs. The REC Foundation believes that the student-centered model of learning is aligned with our mission and provides effective educational benefits to students. The REC Foundation student-centered policy should be frequently reviewed by organizations participating in REC Foundation events.

There are a variety of definitions for the term "student-centered" in the educational community, and the REC Foundation would like to communicate a definition for student-centered that will apply for teams that participate in the VIQC, VRC, and VEXU competitions to increase the transparency of the expectations and increase the student learning opportunities. The term student-centered is encompassed in both the learning and application settings for REC Foundation events and activities:

> ***Student-Centered Learning:*** *Students are actively involved in learning opportunities to increase their knowledge and skills in the engineering design process, mechanical design, programming, and teamwork under the guidance of adult mentorship.*
>
> ***Student-Centered Application:*** *Students have ownership on how their robot is designed, built, programmed, and utilized in match play with other teams and Robot Skills matches.*

The REC Foundation acknowledges that students participating in official REC Foundation events come from a spectrum of educational backgrounds, and ultimately it is the responsibility of the adult to determine the appropriate amount of support for the individual student. Due to the competitive nature of these programs, teams may be tempted to prioritize winning over learning. We encourage adults to ask the following questions in each of your learning experiences with students to help gauge the appropriate amount of support for your students:

- Am I teaching or telling?
- Am I encouraging students to express their voice before sharing my thoughts?
- Are the students asking for my assistance or are they able to be independent?
- Are students able to use the knowledge or skills that I'm sharing independently in the future?

Ultimately, the students learn the most when they are given opportunities to test their own ideas, fail, learn from those failures, and try again. Often in stressful or competitive situations, it may be easier or faster for an adult to solve the problem or fix a robot, but by doing so, the adult is missing a learning opportunity for a student. Instead, we encourage adults to provide guidance when needed to help educate student on the thinking behind problem solving rather than solving the problem. Adults can be a valuable resource to help students learn the skills they will need to work in a team and design robots. In the examples provided below, the role of the adult is primarily a facilitator for learning so that the student may apply the knowledge to their own robot, engineering notebook, game strategy and communication with other teams.

Student-Centered Guide

Using the Guide

This guide includes expectations for organizations and their team members concerning the REC Foundation's student-centered policy and contains examples of student-centered activities to provide transparency and to encourage student learning opportunities. This guide does not encompass every possible scenario that may arise at an event or in an outside learning environment, so participants will need to refer to the spirit of these examples to help interpret situations not explicitly covered.

The overarching mandate is that adults should not provide an unfair competitive advantage by having students use designs, programs and game strategies that are inconsistent with the students' ability and knowledge base.

Terms

Common terms have been defined below to simplify the language in the provided examples.

- **Student**: A student team member participating in REC Foundation events or activities. Please refer to the VEX IQ, VRC, and VEX U game manuals for program specific age/grade levels.
- **Adult:** A teacher, parent or mentor that serves to provide educational guidance to the students.
- **Event:** Competitions that are posted on Robot Events and fall under the REC Foundation jurisdiction.
- **Outside the Event:** Any learning environment outside of an official REC Foundation Event. This can refer to any location where teams are meeting to learn and build their robots.

Interpreting the Guide

The provided examples are grouped into two main sections: "At Events" and "Outside the Event". Each section shares tangible examples of behaviors that range from student-centered to non-student-centered. The columns are color coded to help communicate the goals for increased student-centered learning and to share behaviors that are not aligned with our mission.

- **Green:** This column represents the goal for student-centered learning and application. Students and adults should strive for these behaviors, although it expected that novice students may need adult guidance to achieve these behaviors.
- **Yellow:** This column represents examples of appropriate adult guidance that may be given to novice students to help them achieve student-centered learning and application. Adults should be cautious that they reserve these supports for students that need them and strive to remove supports when appropriate.
- **Red:** This column represents examples of adult guidance that is not aligned with the REC Foundation student-centered policy and may be considered a violation of the Code of Conduct.

At Events

Game Strategy		
Students collaborating to discuss game strategy with alliance partners at the practice field, team pits, and queuing areas. Adults offering cheerful and positive encouragement as a spectator during matches and helping students to reflect after a match is complete.	Novice students consulting with adults on overall game strategy tips for their own team. Adults explaining how an event is run and assisting novice teams in getting to their match on time or finding alliance partners.	Adults giving students on their team or alliance partners step-by-step match play instructions prior to or during a match.
Mechanical Design		
Students actively working on their robot and investigating failures. Adults sharing troubleshooting strategies when students have questions.	Adults demonstrating how to assemble a component or make minor repairs with the assistance of novice students. Students make improvements after the demonstration is completed.	Adults building or fixing the robot with no student assistance or students only watching.
Programming		
Students creating and revising their own programs and explaining code functionality and development over the season. Students can demonstrate applying programming concepts contained within their code. Adults sharing troubleshooting tips when students encounter a complex programming task.	Adults demonstrating a programming feature or sharing new programming knowledge to novice students. Students are programming the robot during and after the demonstration.	Adults programming or revising code. Students are unable to explain the code functionality or development without adult assistance. Students cannot demonstrate applying programming concepts contained within their code.
Pit Interviews		
Students collaborating to discuss possible interview questions and responses. Students can describe how their robot was designed, built, and how their program code functions. Adults being respectful of the interview process and allowing student to represent themselves independently.	Adults reviewing best practices with students on how to effectively speak to judges. Adults assisting with ensuring students are available in the Pit area for judges.	Adults actively prompting students during pit interviews or being a distraction to students or judges during the interview process. Adults answering interview questions or approaching judges after an interview to attempt to add information.

Outside the Events

Game Strategy		
Students watching the game video and reading the game manual to review robot criteria and scoring strategies. Adults reviewing scoring techniques and reflection strategies with the students. Students agree on game strategies to influence robot design and match play.	Adults modeling for students how to organize game information needed to help influence robot design. Adults organizing mock game scenarios to develop students' teamwork and communication skills.	Adults telling students which scoring strategies to use to influence robot design or providing step-by-step instructions on how to play in a match (driver or autonomous).
Mechanical Design		
Students brainstorming and researching mechanical design ideas, building and testing prototypes, and assembling their robot. Adults teaching students basic building techniques or mechanical design concepts that students can modify and apply to their robot. Design ideas leveraged from other teams or videos should be credited in their engineering notebook and during Pit Interviews.	Novice teams utilizing a robot built from instructions provided by VEX Robotics as a starting point. Students make improvements to these designs as the season progresses. Adults providing primitive pre-made mechanical design learning tools (ex: 4-bar linkage) for novice students to reference, and students build and modify mechanisms for their own robots.	Adults providing students with pre-made instructions or a model to copy for competitive robot designs. Adults building the robot with no student assistance. Adults building or designing all or portions of the robot that is used "as-is" at an event. A robot built by students from instructions provided by VEX Robotics are an exception and are allowed.
Programming		
Students programming their own robot (driver and autonomous) and developing an autonomous strategy. Adults teaching students basic programming techniques or pseudocode that students can modify and apply to their robot. Programming concepts or tools leveraged from other sources should be credited in the code as comments and in the engineering notebook.	Adults teaching general programming fundamentals that can be uses as tools for students to create custom programs for their robots. Students using the pre-installed driver programs is allowed.	Adults developing an autonomous program or strategy with no student input. Adults programming the robot (driver or autonomous) or providing custom code to copy/paste into a program. Students are utilizing programming techniques that are beyond their ability to explain or create independently.
Engineering Notebook		
Students document their robot design process in their team's engineering notebook throughout the season. Students and adults review the	Adults assisting with the organization of the engineering notebook and modeling documentation strategies for students. Students apply these	Adults writing, creating, or editing portions of the engineering notebook documentation. Students failing to properly credit ideas

Design Rubric and discuss ways to improve documentation. All documentation is a product of student work.	strategies to their own notebook and in their own words.	or code leveraged from outside sources.
Pit Interview Preparation		
Students practicing mock pit interviews and getting feedback from adults and other students. Students and adults reviewing the Design rubric and sample judge questions.	Adults and students working together to practice talking about their robot design process.	Adults giving students scripts or step-by-step instructions of what to say in their pit interview.
STEM Research Projects (VIQC) & Online Challenges		
Students select and complete the project/challenge requirements. Students and adults reviewing the project/challenge requirements. Submissions represent the product of the students' ideas and work.	Adults assisting with reviewing the project/challenge requirements with students and providing feedback on students' ideas or work. Adults assisting with the upload process.	Adults creating all or a portion of a project/challenge product. Adult feedback drives the direction of the project.

Communicating and Enforcing Student-Centered Guidelines

Within Your Organization

The REC Foundation highly recommends that organizations carefully review the student-centered policy and share this policy with all students, teachers, and other adults associated with the team at the beginning of each season. Each registered team on Robot Events is required to provide a Primary Contact, and for VIQC and VRC, this contact must be an adult (18+ who has graduated high school) that is designated to manage and be the primary point of contact. The Primary Contact is typically the person that accompanies the team to events and is responsible for ensuring all team members, including parents associated with the team, comply with the student-centered policy. If the Primary Contact cannot attend the event, then another adult accompanying the teams should be trained prior to the event to fulfill this role. Below are a few suggested methods to communicate and enforce the student-centered policy within your organization:

- Host a team meeting at the beginning of the season to review the student-centered guide with students and adults associated with the team. Create clear expectations for adults that are mentoring teams and attending events.
- Model student-centered learning activities for adults to show the educational benefits.
- Encourage parents to volunteer at events – this provides a valuable resource for event partners!
- Team activities outside of events should be supervised by an adult familiar with the student-centered policy.
- Teach students how to advocate for themselves and give positive reinforcement for student-centered learning.

- Develop definitions of success within your team structure that values individual team goals and growth throughout the season.

REC Foundation Enforcement

The goal of this guide is to communicate expectations to organizations and encourage an alignment of best practices within the community. The REC Foundation will evaluate concerns related to behaviors inconsistent with this policy per the Code of Conduct. Although it is never the desire to punish students for adult behaviors, it is imperative that organizations are held accountable to ensure fairness and increase the learning opportunities for students.

VEX Worlds and Events that Qualify Teams Directly to VEX Worlds

Teams should expect increased scrutiny of student-centered behaviors at VEX Worlds and events that qualify teams directly to VEX Worlds. The REC Foundation reserves the right to individually interview teams to determine compliance with the student-centered policy. In general, team behaviors observed at VEX Worlds, and at events that qualify teams directly to VEX Worlds, should fall in the "green" column in the Student-Centered guide.

Student team members should be prepared for the following if called into an interview by an approved REC Foundation committee during VEX Worlds or an event that qualifies teams directly to VEX Worlds:

- Describe in detail the development and functionality of the robot design and program(s) utilized on the robot being used at the event.
- Provide an electronic copy of all programs used in Programming and Driving matches upon demand.
- Demonstrate programming concepts on par with the concepts included in their code without adult assistance.

If a student team member that has expertise on a specific portion of the robot design or programming cannot attend the VEX Worlds or an event that qualifies teams directly to VEX Worlds, the other attending team members should be prepared to share the knowledge and demonstrate functionality.