

**Diversity and Collaboration: Keys to Unlock Success**

Team 2657A - Redwood City, CA

Amani, Dev, Joshua, Monika, Supriti, Sushant

## Diversity and Collaboration: Keys to Unlock Success

“Let’s test this programming code one more time!” Supriti exclaimed. Our team’s programmers, Amani and Supriti, worked furiously on the code. Though they were undertaking programming for the first time, their enthusiasm was palpable. The date was October 21, 2021, and our next tournament loomed nine days away. As the code finished downloading, Supriti pressed start. The robot raced across the field, dragging neutral goals. Feeling satisfied, Amani urged, “We should work on the autonomous code now.” We opened up a new file of code with anticipation.

“We have to transfer all the code for the forklift and robot speed from this code to the next, but I wonder if there is a way to duplicate the code? That would be more efficient.” Amani questioned. A thoughtful look struck both of our faces. Amani duplicated the file and clicked on it. Assuming it was the duplicate, we deleted all the previously written code.

“Before we start adding to the code, let’s double-check that the other code is still there,” Supriti advised. “Good idea,” Amani agreed. We clicked on the code menu, confident that the previous code was still there. Oh no! We scanned our eyes over the code menu multiple times, but the results would not change, despite our fervent prayers. The original skills code had disappeared! Shock and dismay engulfed us. Without saying a word, we both clicked frantically on Amani’s computer, desperately trying to find pieces of the code we had written.

At that time, we knew we needed our veteran team members’ advice. Rather than scorn, we were met with the support and guidance that encouraged us to remain resilient. This support helped push us to reprogram the code in one week by meeting at Supriti’s house every day for hours after school. There were moments of absolute defeat and pure frustration, and much trial and error, but remarkably we always encouraged each other to move forward. As a result, we were able to create a successful code, even better than before, within a week.

We are The Hexperts, 2657A, a new high school, VRC team -- **“Girl Powered” because we truly value diversity and collaboration.** Our team’s diversity is our strength because each of us

contributes valuable, diverse skills: mathematical prowess, strategic thinking, creativity, clear communication, disciplined decision-making, and enthusiastic spirit. We have six members, three boys and three girls: two 8th graders (Supriti and Amani), three 9th graders (Monika, Dev, and Joshua), and one 10th grader (Sushant). This is Amani's first year in robotics; Dev and Joshua's second year in robotics; and Supriti, Monika, Sushant have been in robotics for over five years. Those with more experience in robotics use their knowledge to guide the team, while those new to the team bring fresh ideas to the table.



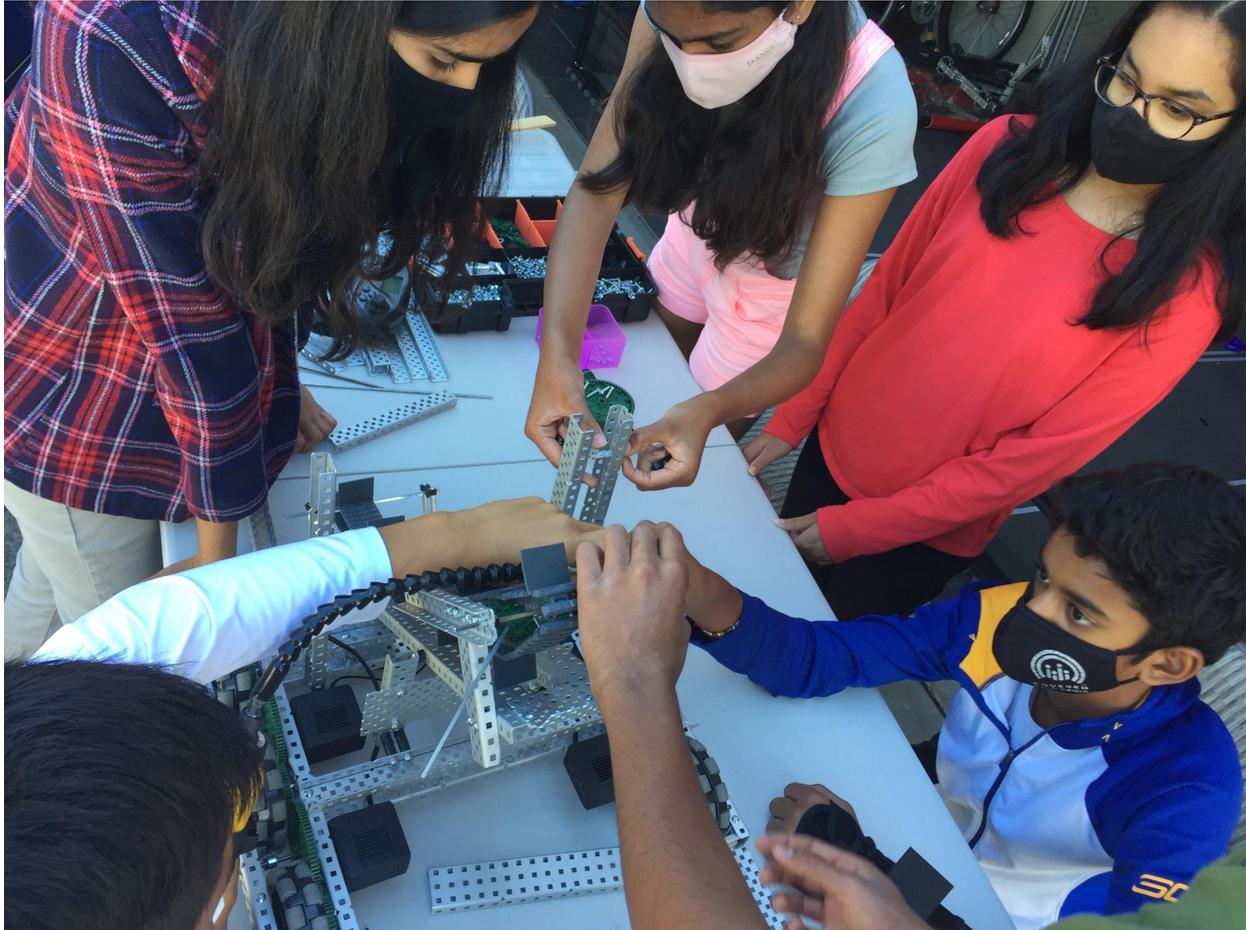
We all have specialized roles in the team: Supriti and Amani lead programming; Dev, Joshua, and Sushant lead building and drive the robot; and, Supriti, Amani, and Monika lead online challenges. We also have other roles that ensure our team unity: Monika as team spirit leader and “Updaters” that keep the rest of the team informed. Our “Updaters” concept is one of the reasons

that we won the Innovate Award at a recent tournament. Despite our specializations, each member of our team has a chance to build and program, as well as contribute to online challenges. Our different ages, levels of experience, perspectives, and skills, along with half of us being girls, make us a stronger team, and this diversity has contributed to our ranking of 142nd in the VEX World Skills Standing and 14th in California (260 in driving and 100 in programming skills). That is why *diversity and collaboration are the keys to our success.*

At the beginning of the season in June 2021, we all contributed ideas when brainstorming for our first robot design. “If we have two forklifts, that will allow us to be more efficient,” Dev proposed. “I agree with that, however, we may not have the time to build that, given the date of our upcoming tournament,” Monika countered. “How about a ring pole scorer? It can store and collect multiple rings and then flips over to deposit all the rings at once,” Supriti contributed. “Good idea. It can also combine with a forklift for maximum efficiency,” Sushant pitched in. “Yes, for the autonomous win point, we will need to score one ring on each goal,” Amani noted. So it continued, as we shared the positives and negatives of each design idea and created our evaluation chart. We each contributed ideas, but a collective discussion helped us to evaluate. “Wow, I think this robot design is really starting to come together!” Joshua remarked, as he read through the list of decided mechanisms and reflected on the many discussions and meetings that had brought us to the completed evaluation chart. Our collective efforts had produced something greater than its original parts.

Two months later in August, we realized that a complete reconstruction of our robot was necessary, but with only a month and a half until our next tournament, all of us began building. We set up tables and worked together, first brainstorming forklift ideas and then prototyping two of them. Prototyping helped us to evaluate the best design. “Amani, what do you think of this forklift design?” asked Dev as he tightened a bolt on the forklift with Joshua’s help, while Supriti, Monika, and Sushant built the double-reverse-four-bar-lift. Amani, Supriti, and Monika learned the basics of

the building and assembly process from the builder leads and made significant progress in the building of the central lift mechanism for our robot, while Sushant, Dev, and Joshua built the base and forklifts. By including the entire team in the building process, not only were we more efficient, but each of our teammates felt pride in the final design.



This collaboration extends to creating our team [website](#). “Why don’t we move this image here?” Amani asked, pointing at Monika’s computer. “Agreed, and I have some ideas for the VEX Resources page,” Supriti added, gesturing to her notebook. “Sure, and then we can review the other feedback that the team has sent us,” Monika noted. Amani, Monika, and Supriti looked at the list of comments from the rest of the team and implemented each of the suggested changes. Monika had

taken the lead in the creation of our website, but with our team's helpful suggestions, we were able to improve the website -- a true, team effort.



Of course, we also collaborate during tournaments, especially in alliance selection decision-making. We transport you to December 5, 2021, the Dublin Tournament. During a long day full of driving practice, programming modifications, and strategizing, Supriti, Monika, and Amani had been gathering analytics on other teams, such as points earned, mobile goals scored, ability to elevate mobile goals, and the like. As the finals were about to begin, we huddled together. "This team was able to get 40 points in the autonomous period!" Joshua stated, pointing at the list of teams. "But, their game strategy is a defensive one," Amani countered, glancing at her notes. "Let's just stick with these three teams and consider the others, if the situation arises," Supriti proposed. Everyone

noded their heads in agreement. We were confident in our decision because we made it together.



What lies ahead for us? Our goals are to continue improving our skills scores in both driving and programming, and to improve our tournament driving strategy, so that we may compete at the VEX Worlds Competition. One thing is for certain -- we know that our success is directly attributable to our team's diversity and ability to collaborate, something that our previous Principal, Tami Moore, instilled in us. Principal Moore founded and led for six years the VEX robotics program at Sandpiper School (which all of us attended). Because of Principal Moore's teaching, the team environment and culture that we have created is one we would like to see mirrored in our classrooms and the rest of the world, where diversity is celebrated and differences are appreciated, where everyone's voices are respected and heard.



Credits: “Diversity and Collaboration: Keys to Unlock Success”

The Hexperts, Team 2657A

(Left To Right) - Joshua Edwards, Amani Shroff, Monika Mukerji, Supriti Bhopale, Sushant Bhopale, Dev Patel