

# How to Grow Your Own Botballers

## 1. Introduction

After seven years as a Botball coach, many of my team members who have been with me from the start are soon to graduate from high school. They started in middle school on the Botball team and a core group have continued. Although the teams recruit new members each year only a few new students have come along. Some have stayed and some have left the team over the years.

Botball was part of a robotics program that I started at John Glenn Middle School. I am a technology/media consultant for the school district. Although I no longer work for John Glenn, but am a consultant to an elementary school and a middle school in the same district, I still continue to work with my core group. Three years ago the elementary school I work with allowed me to start a robotics program. Fourth and fifth graders participate in the FIRST LEGO League and second graders are part of a year long robotics project I began called Dynamic Robotics. They study about robots through writing and art. Then they build small LEGO robots using the RCX controller.

## 2. Growing Botballers

I have always felt that to encourage students to join Botball, you should start young. Over the years my Botball teams have put on robotics workshops for younger students to raise money for their teams. These have been very successful. (See picture 1.) The last workshop for 2nd through 6th graders was attended by more than 30 students.



Picture 1: High school student, Brandon, (middle) helped with the Great Robot Challenge workshop for younger students.

The day long workshop sparked interest among the younger students and some of these students have already joined the middle school Botball team now that they are in the sixth grade.

The students are very receptive and extremely excited about robotics. The students and parents always want to know how to become part of the robotics program or how to start one at their school. So when the opportunity arose, I put into motion a program to 'grow Botballers.'

To grow any type of plant, all you need is an appropriate environment in which to plant your seeds and the right amount of water, sunlight and nutrients to nourish them. I was afforded all of these things in order to grow my own Botballers for future teams. The elementary school where I work has an extensive after school program. Besides the remedial and homework help type classes, there is also abundant enrichment opportunities for the students. I suggested that we offer a mentoring program where middle school students act as tutors for the younger elementary school students.

## **2.1 Community Team**

Both principals from the elementary school and the middle school were receptive to an idea to create a community Botball team. The team members would be sixth graders that were previously students from the elementary school that are now enrolled in the middle school. The middle school and elementary schools are on adjoining campuses so it is easy to combine after school programs. My suggestion was to pull the sixth graders back to the elementary school to become a community Botball team. Many of our students get lost in the shuffle of the middle school, so this would provide an opportunity for them to be part of an exciting enrichment program as sixth graders. But these students would not only be Botball team members, they would also become cross-age tutors for fourth and fifth grade students.

The core group of sixth graders would mentor fourth and fifth grade students. They would all work together on the Botball team. The sixth graders would be in charge and the fourth and fifth grader would help out with the team. The first year there was a problem with this idea though. The sixth graders would also be new to Botball, so they would have to work very hard to be able to help the younger students. Each of the sixth graders worked with a small group of students. The team started with 3 sixth graders and 9 fourth and fifth graders. A few of the students had previously been on the FIRST LEGO League team so they knew something about robotics. This was a big help. But there was a lot for them to learn, not only about robotics but about how to mentor younger students.

The first year experiment went quite well, so both schools were eager to repeat the process this year. One twist that was added though, was to create an all girls team instead. There were a few



Picture 2: Middle school sixth grader, Brittany (far right), explains the Botball Tournament game to the fifth grader girls.

middle school girls who wanted to have a girls Botball team, so 6 fifth grade girls who had worked with Botball last year became part of the team. The sixth grade girls acted as the mentors and the group met at the middle school along with the other Botball teams in our Desert Robotics group. (See picture 2.) Having the girls come over to the middle school was an added bonus. They had the opportunity to get used to the middle school environment and mingle with some of the middle

school students. This will hopefully make their transition from elementary school to middle school easier. Many of the girls made comment during the documentation process for the Botball regional tournament that the one thing most important to them about Botball was the opportunity to make new friends with the middle school students. The sixth grade middle



Picture 3: Sixth and seventh grade boys working on strategy and design with 2 sixth grade girls. (Left to right: James, Parker, Giselle, Mekai, Jesse)

school girls also commented on how nice it was to be able to mentor the girls and have a large group working on the Botball project.

The middle school has four Botball teams; three boys teams and one all girls team. The boys teams are made up of 6th, 7th and 8th graders. Everyone got along well and members of the team were very happy to work with the girls sharing their experience and knowledge. (See picture 3.)

The sixth grade girls made up the regional all girls Botball team, but the fifth graders played an important part on the team. They helped with the organization of all the LEGO pieces, kept track of the documentation logs, and submitted ideas for the robot strategy and construction. They also all attended the regional tournament and two of them, Mekai and Giselle, made the documentation presentation for the team. Only 1 sixth grade girl, Kelly, was able to attend the tournament so the fifth graders came to the rescue and helped out where ever they were needed.

## 2.2 R& D Website Challenge

Last year the group of students' first project for the team was the R & D Website Challenge in the fall of the year. I wanted to start with this project because the students would get a sense of what robotics was all about. The two schools with students on the community Botball team are part of a magnet school group focusing on environmental science. The research and writing project also met many of the grade level state standards and the environmental science standards for our school. The subject of the challenge was also perfect. Likewise this year, the girls team started with the R & D Challenge. Again it was a perfect match for the schools and the grade level curriculum.

The younger students worked along with the official Botball team members, helping with the research and coming up with ideas for the project. They helped review the research team's written papers for information that should be included in the their website for the R & D Challenge and then they wrote reports for the website pages. (See picture 4.)

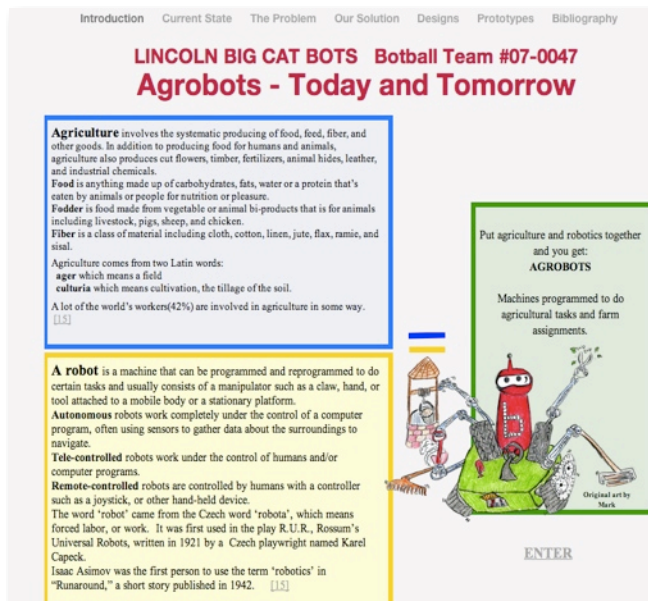
Each year our Bobtall teams invite other students (6th - 8th grade) to help with the R & D Challenge by writing research papers on the subject. Their classroom teachers give them credit and they submit the final papers to the Botball teams as a resource for their website project.



Picture 4: Giselle, Sonia, Leslie, and Mekai work on the website research.



This process seems to work well. Both years the Botball team was able to post a winning website for the Research and Design Challenge. (See Pictures 5 and 6.)



Picture 5: Winning Website from 2007



Picture 6: Winning Website from 2008

## 2.3 Cooperation

The middle school students worked very hard to make the younger students a part of the team. Everyone worked on the strategy and helped with the design and building of the team robots. Some of the middle school team members gave lessons on programming for all the students and helped with the construction ideas.

Kelly and the other sixth grade girls designed two robots for the tournament. One was named the Collector and the other Dropbot. (See picture 7.) The robots are really a product of collaboration and team cooperation. All members of the 4 teams help each other with strategy ideas, building skills, and programming.



Picture 7: Kelly working on the robot.

All the students who did any work on the Botball team were invited to attend the regional competition in San Diego. All the fifth grade girls were able to come to the tournament and participate. The only sixth grader from the team that was able to come was Kelly. She really did a



Picture 8: Mekai and Giselle working on the duplicate robot

great job and was appreciative of the support from the other girls.

Under the direction of the older students the younger ones get a chance to do many things. One job that the younger students had was to make a duplicate robot for the tournament. (See picture 8). This really came in handy at the tournament when one of the robots, the Dropbot, was accidentally dropped and broke into pieces. This robot folds and has two separate parts that join together

in an unusual way. Kelly couldn't get the robot back together in time for that round, but when she returned to the pit, the other students had the duplicate there to show the way to repair Dropbot for the next rounds. All the Desert Robotics teams work together and help each other. This has led to a good spirit and a successful team. (See picture 9.)



Picture 9: Desert Robotics teams 08-0083, 86, 87, 88 with awards from the regional tournament.

### 3. Grow Your Own 'Botballers'

Don't overlook the potential Botballers in your area. Cultivate them instead. You have the environment and the all the ingredients you need right in your own Botball team. There are a lot of great Botball kids just waiting to get into the game. Seek them out and mentor them. Your payoff will be a great crop of 'Botballers' ready to make your team a success in the future.

Botball sponsored by KISS Institute for Practical Robotics <http://botball.org/>