Community Engagement through Robotics – Building an International Network without Traveling

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Introduction

- Robotics has been identified as a tool to excite students about STE(A)M careers
- Significant interest in the community
- Existence of a vast variety of robotics challenges
- Most challenges require physical presence
- International participation is only possible for best teams
Virtual Get Excited About Robotics (GEAR) Competition
GEAR Challenge

• 8 week LEGO Robotics Challenge
• 2 minute matches
• List of tasks that the robot needs to accomplish autonomously to score points
Purpose and Program Growth

• Broaden participation in GEAR (Get Excited About Robotics)
• Offer low cost competition suitable for beginners
• No travel required, all products are submitted online

<table>
<thead>
<tr>
<th>Number of teams</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>1 (TX)</td>
<td>8 (TX &amp; AZ)</td>
<td>13 (AZ &amp; TX)</td>
</tr>
<tr>
<td>Germany</td>
<td>3</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>South Africa</td>
<td>12</td>
<td>33</td>
<td>49</td>
</tr>
<tr>
<td>Namibia</td>
<td>4</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Costa Rica</td>
<td></td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>
## Competition Schedule

<table>
<thead>
<tr>
<th>Time</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 31</td>
<td>Register online</td>
</tr>
<tr>
<td>February 1</td>
<td>Game field and game element information is sent out to registered teams</td>
</tr>
<tr>
<td>February 14</td>
<td>Upload Team Introduction Video and share link with organizers</td>
</tr>
<tr>
<td>February 15</td>
<td>Game rules and all Team Information Videos are sent out to all team coaches</td>
</tr>
<tr>
<td>March 31</td>
<td>Upload Trial Run Video – Teams receive scores and feedback</td>
</tr>
<tr>
<td>April 30</td>
<td>Upload Engineering Design Videos</td>
</tr>
<tr>
<td>May 7-19</td>
<td>Game Day</td>
</tr>
<tr>
<td>May 31</td>
<td>Announcement of Awards</td>
</tr>
</tbody>
</table>
Game Instructions (February 1)

• Teams receive drawing of game field and need to build their own (print, tape, etc.)
• Teams receive information about game elements and need to purchase/build their own (supermarket, hardware store, 3D printing)
Since everyone keeps playing on their own game field, game elements can look slightly different.
Team Introduction Video (February 14)

• Who are you?
• Where are you located?
• How is robotics implemented at your school/club?
• Why are you participating?
Release of Game Rules (February 15)

- Annually changing challenge
- Description of tasks
- Scoring during 2 minute match
- 16 page document

General competition rules were sent out with game element list
Trial Run Video (March 31)

• Teams demonstrate what tasks their robot can accomplish
• Feedback on scoring and possible misinterpretation of rules
• All teams receive all trial run videos for inspiration
Teams explain their engineering design process and game strategy.

Teams explain which tasks their robot will attempt to complete and how they designed their robot to do so.

Video is scored.
Game Day (May 7-19)

- Team coaches schedule game day with local organizer, who will attend either via video conference or in person
- Opportunity for teams living in same area to meet and hold competition at of of their locations
- Robot performance is video taped to share with other teams
- Video is scored
Awards (End of May)

- Teams receive all scoring information and certificate
Building an International Community
Key Component - Communication

Local facilitators:
• promote program and STE(A)M careers
• make arrangements for in-country participants
• host events and mini-competitions
• provide training opportunities
• secure local funding
• have crucial local expertise
Key Component - Communication

Coaches & Teachers:
- communicate with program providers
- recruit participants and schedule robotics meetings
- share videos from other teams to build a community
- build a network to support each other
Key Component - Communication

Social Media:

• choose App that already has the greatest penetration among participants
• enables group communications and ease of use
• is cell phone based and inexpensive
• can be used for all official communication
• allows to connect participants
• is scalable
Thank You!

Q&A