

Michigan *FIRST* Robotics Competition District Tournament Pilot

Evaluation Summary

Alan Melchior
Center for Youth and Communities
Heller School for Social Policy and Management
Brandeis University

In 2009, the *FIRST* Robotics Competition (FRC) in Michigan piloted a new state tournament process aimed at expanding the tournament structure and at providing FRC teams with more opportunities to compete at a lower overall cost. Main elements of the new tournament format include the following:

- Establishment of a district tournament model in which Michigan teams would compete in two or more district-level tournaments, with winning teams proceeding to a state championship tournament.
- District tournaments would take place in lower cost venues than the traditional state championship, would last for two days rather than three, and would use more off-the-shelf graphics and sound systems (thus, reducing tournament costs).
- The basic team registration fee of \$5000 (\$1000 less than the standard FRC registration fee) would provide for participation in two district events; an additional fee of \$4000 would be paid for participation in the state championship tournament.
- Other changes aimed at reducing costs include reduced travel costs (because tournaments would be more local and shorter); transportation of the robots to the tournaments by teams (kept in a locked “bag” arrangement after the build period); and an at-home pit/preparation “access” period to make it possible to reduce time spent by teams at the district tournaments.
- Michigan teams would retain the capacity to compete in other state/regional tournaments outside of Michigan, and teams that participated in the Michigan State Championship would have the opportunity to qualify for the national *FIRST* Championship in Atlanta.

In order to evaluate the pilot tournaments, *FIRST* contracted with Brandeis University’s Center for Youth and Communities to conduct a series of surveys of participants in the new tournament model. Three key questions guided the survey process:

- Was the new model seen as successful by team leaders, mentors, and team members in meeting its goal of providing more opportunities to compete at lower cost?
- Did the district model continue to deliver high quality, engaging tournament experiences for team members, coaches, volunteers and others? Were the district tournaments well-organized and run? Did they exhibit a level of quality (consistency in judging, etc.) and excitement that met FRC standards and participant (coach, team members, others) expectations?
- In terms of sustainability, were the district tournaments also able to successfully recruit and train needed volunteers and tournament officials, and did those tournament/event volunteers report a positive experience working on the district model?

To address those questions, Brandeis conducted three online surveys between mid-April and the end of May, 2009: a survey for team leaders and mentors; a survey for tournament volunteers; and a survey of team members. The surveys for team leaders/mentors and team members were similar, focusing on their assessments of the tournament experience. The survey for tournament volunteers focused on the training and support they received and the quality of their tournament experience.

Invitations for the team leader/mentor survey were emailed by Brandeis directly to team leaders and a list of alternative team contacts. Team leaders were also asked to pass the link for the team member survey on to their team members (since no direct contact information was available) and ask them to complete the survey. The invitation for the tournament volunteers was also emailed directly to volunteers, using a contact list provided by *FIRST* in Michigan.

Overall, there was a strong response to the survey, particularly given the end-of-season timing. Invitations for the team leader/mentor survey were sent to 135 team leaders and 135 alternative contacts. 79 team leaders and 48 mentors responded, for a response rate of approximately 47%. Invitations for the event volunteer survey were sent to 252 volunteers, and 116 responded, a response rate of approximately 46%. 192 individuals responded to the team member survey, including 127 from youth team members (under age 20) and 65 from adults over age 20, presumably adult volunteers working with the teams. Since the original number is unknown, no response rate can be calculated. The responses of the adult volunteers were merged with those of team mentors and are reported in the mentor/adult volunteer tables in report.

The tables attached summarize the results from the survey process. Where possible, tournament ratings are presented separately for team leaders, mentors/adult volunteers, and team members, and for all three groups combined. Most of the results for tournament volunteers are presented separately (pages 16-19), since their survey addressed a separate set of questions. Responses to open-ended questions about the strengths and drawbacks of the tournament experience, and suggestions for improvements are also included.

Key Findings

Tournament Ratings. Overall, the response to the Michigan District Pilot Tournaments was positive. The large majority of survey respondents reported that they were satisfied with their tournament experiences, including positive assessments of the tournament venues, management of the tournament process, quality of the tournament experience for the teams, the new procedures developed for the Michigan pilot (“bagging” the robots, transporting the robots to the tournament, etc.) and, to a somewhat lesser degree, the total cost of participation. In total, 94% of the team leaders, mentors, and team members responding to the survey rated their experiences as “Good” or “Excellent”. Specific ratings include:

- The majority of respondents were satisfied with the tournament venues. 85% or more were satisfied with the pit and competition areas. 75% were satisfied with conveniences such as food and parking. Seating for spectators received the lowest ratings (66% satisfied), primarily as a result of dissatisfaction with arrangements at one site (Kettering University).
- Over 85% of respondents indicated satisfaction with the tournament management: quality and consistency of refereeing, judging, availability of volunteers on site, and

overall flow of the events.

- Roughly 80% or more were satisfied with the team experience. 90% or more were satisfied with the number of matches played, the number of competitive teams, ability of team members to attend, and the spirit of Gracious Professionalism at the tournament. 89% were satisfied with the overall energy and excitement of the events. Areas rated slightly lower (though still 80% or more satisfied) included time to prepare/practice at the event (80%); opportunities to meet with other teams (85%) and number of students, parents, etc. able to attend (81%).
- Teams had a more mixed response to the new Michigan rules, and the responses to open-ended questions highlighted concerns with the structure of the new scoring system, the restriction of the pilot to Michigan teams (teams missed meeting others from out of state), and the short time available to decide on attending the state Championship. At the same time, over 80% were satisfied with the use of a statewide scoring system and the pre-tournament “access period;” 70% or more were satisfied with the fairness of the scoring system, the bagging, and the robot transport arrangements.
- Teams were generally satisfied or “neutral” with regard to tournament costs. 70% or more were satisfied with the travel and transportation costs for the district tournaments, and 62% were satisfied with the district registration fee of \$5000. Fewer (only 37%) were satisfied with paying the additional State Championship fee (37% reported “neutral” on that question; 29% unsatisfied). Overall, 52% were satisfied with the tournament costs, 28% were “neutral”, and 20% were unsatisfied with the cost structure.
- As noted above, the overall ratings were strongly positive: 64% rated their experience as “Excellent”, 31% as “Good”. Only 5% thought their experience was “Fair” and less than 1% indicated it was “Poor.”

Matches and Costs. Data from the team leaders and mentors indicates that the 2009 Pilot met its goals of providing for more “plays” at a generally lower cost.

- Teams reported playing in an average of 26 matches in their first two District events. 97% of the team leaders/mentors indicated that their teams had attended two or more of the district tournaments. Approximately 71% of those responding went on to the State Championship, where they played an additional 10 matches. 15% also reported attending events outside of Michigan.
- Team leaders and mentors estimated that the average team cost for the District Tournaments in 2009 was approximately \$9900; costs for teams attending the State Championship averaged an additional \$5900. Total estimated costs for all teams in 2009 were \$12,000. Teams that participated in prior years estimated that their team budget in 2008 was \$25,000.

Comparison to 2008. Team leaders, mentors and team members who participated in FRC in 2008 (the prior year) were asked to compare their experience along a number of dimensions (opportunities to compete, quality of tournament experience, cost, etc. These results were also generally positive, with the large majority of respondents indicating that their experience in 2009 tournaments was either as good or comparable to that of the prior year. Specifically:

- 88% of respondents indicated that the opportunities to compete in 2009 were “A little better” or “much better” than 2008; 98% indicated that it was the same or better.
- 97% of respondents also reported that quality of refereeing was the same or better; 95% thought the judging was the same or better.
- 88% thought the quality of the competition was the same or better; 92% thought that the overall quality of the experience (Gracious Professionalism, etc.) was the same or better, and 90% thought their team’s satisfaction was the same or better.
- 90% of the respondents thought the cost of participation was the same or better than 2008. 86% thought the logistics were the same or better.
- The lowest rating was on the quality of facilities. However, even there 79% of respondents rated 2009 as the same or better than 2008 – 21% thought the quality of the event facilities was worse.

Tournament Volunteer Experience. Tournament volunteers were also generally positive about their experience, suggesting that, in Michigan at least, there was some capacity to manage the more complex tournament structure. Tournament volunteers responding to the survey included judges (50%), set-up/field construction volunteers (20%), planning team members (16%), and general event volunteers (8%).

- 90% or more of tournament volunteers were satisfied with the training and support they received prior to and during the tournaments. 93% felt their roles were clearly explained, 96% felt they had adequate training; 97% said the core values of FIRST were clearly explained; 94% said the amount of work they were asked to do was reasonable, etc. Overall, 93% rated their preparation/support as “Good” or “Excellent.”
- Tournament volunteers also rated their event experience positively, with 90% or more agreeing that their role was what they expected, that they were recognized for their efforts, that teams were appreciative, and that they had opportunities to meet new people. Overall, 96% reported that they enjoyed their time as a tournament volunteer.
- Finally, most tournament volunteers were satisfied with the time and effort involved with the program. 85% reported that the time required was about what they expected (16% indicated it was more than they expected); 94% said that they were satisfied with the time that was required.
- Overall, 94% of the tournament volunteers indicated that they would “likely” or “very likely” volunteer again next year.

Open-Ended Responses. The open-ended responses provide additional insights into both the strengths and drawbacks of the district tournament experience. Among the most consistent concerns were with the emphasis of the scoring system on robot performance (and lack of emphasis/points for other awards); the lack of contact/involvement with out-of-state teams, continued high costs for teams and the short time-frame for decision-making for teams that qualify for the State Championship, and the continued relative advantage of more affluent teams. These kinds of issues are important to address in any future planning. However, given the generally positive response evident in the surveys, they need to be seen as needed refinements/improvements rather than significant shortcomings in the model as a whole.