

**Muncie/Delaware Robotics, Inc. Strategic Plan**  
*Muncie/Delaware FIRST Robotics Team 1720*

2007 – 2012



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# Muncie/Delaware Robotics, Inc. Strategic Plan 2007 – 2012

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## Strategic Plan Concept

Muncie/Delaware Robotics, Inc. (MDR) seeks to utilize discovery, learning and engagement to cultivate student interest, understanding, and skills in science, technology and engineering. Through the MDR program, students will gain skills and knowledge applicable to a career in science and engineering and utilize these skills throughout their lives. By partnering with local Delaware county corporations and businesses, these students are more likely to remain or return to the area with these skills and thereby grow technology in East Central Indiana.

## Preamble

Muncie/Delaware Robotics Team 1720 is a unique collaboration of youth and adult professionals, college students, teachers, parents, and community members. The Team offers a unique experience working together for the development of our youth, the community and the future of technology.

[Muncie/Delaware Robotics](#), Inc. is a tax-exempt not-for-profit educational program that serves all of Delaware County, Indiana. FIRST (For Inspiration and Recognition of Science and Technology) is a NASA-sponsored organization that focuses on inspiring students in the fields of science, technology, engineering and math (STEM) ([www.usfirst.org](http://www.usfirst.org)). The [FIRST Robotics Competitions](#) are regional and national contests that immerse high school students in the exciting world of engineering and technology. In six intense weeks, students, engineers and educators work together to analyze, design, construct, and test a robot. The teams then compete in a spirited tournament complete with referees, cheerleaders, and time clocks. The objectives of the program include education and experience in the technology fields, as well as nurturing creativity in a teamed environment. In the process, the students learn hands-on skills, respectful cooperation, gracious professionalism, business practices, and many other skills that will serve them well as they develop to become adults in the work force and society.

The MDR program is available for all Delaware County high school students, including home schools. Student participants work with high school and university educators and industry professionals to solve complex technical challenges. This first-of-its-kind community-wide extra-curricular activity offers

students experiences in mechanical and electrical engineering, animation, computer aided design, website creation, and an opportunity to build contacts with potential future employers. The program excites students to explore engineering and technology careers, and develop attitudes and skills that will promote life-long success, including integrity, teamwork, leadership and creativity.

## **Mission**

The mission of MDR is to provide a unique hands-on learning opportunity in Delaware County for students to learn science, technology, engineering and math (STEM), skills. Through the use of problem-solving, teamwork, time management, project development and management we seek to cultivate the interest, understanding, and skills in science, technology and engineering while learning teamwork and gracious professionalism. Furthermore, the mission is to help our young people grow into whom they can become.

## **Values and Culture**

Muncie/Delaware Robotics program improves the lives of students by providing a unique combination of education, skills, and experience in a hands-on setting, and exposing the youth to potential career and employment opportunities. The MDR program fills a need for practical applications of a growing technology field, and allows students to apply knowledge and skills learned in traditional classrooms to a real situation, such as will be encountered in their employable future.

FIRST Robotics also provides a constructive outlet for students who may need adult guidance and an activity to keep them in a positive learning environment. The MDR program is open to all high school students and adult mentors of all ethnicities, education and financial backgrounds.

## **Services**

Educational and hands-on STEM opportunities are limited in local schools. Income levels prevent participation in programs which have fees. While the MDR program is not a no-cost program, grants, sponsorships and donations can help make this program available to students who can use these skills gained as a spring-board to a brighter future.

## **Target Audience**

The MDR program is open to all high school students in Delaware County. This includes students from Burris, Indiana Academy, Muncie Central, Muncie Southside, Yorktown, Daleville, Delta, Cowen, Wes-Del, Wapahani, and area home schools. Students and adults of all ethnicities, education and financial backgrounds are encouraged to participate.

The primary target population group for MDR is students from age 14 – 19 years of age for applications of larger-scale robotics and technology concepts. A second population group of students from age 10 – 14 years of age is targeted for Lego and Vex applications of technological outreach programs.

Based on “Kids Count in Indiana” data for 2006, as posted by The Indiana Youth Institute, approximately 29% of Delaware County students qualify for assistance for school lunch program. Students in low-income families will be helped by this program by providing opportunities for them to gain skills, learn applications of those skills in a technological context, and make contacts with future

employers. "With the growing importance of technology to our society, it is vital that students receive an education that emphasizes technological literacy." (ITEA, 2000, vii).

## **Vision**

The vision for this program is to develop MDR into a long-term sustainable, community-based, multi-school program in STEM, with recognition within the community, school systems, and local businesses and corporations.

By educating our youth with skill-sets of the future, technology-based economy can be retained in our region. As a result of offering this program to all high school students in Delaware County, especially students at risk, it is possible to change the lives of these young people by providing them a technology-based problem-solving skill-set for the future.

## **Goals**

The goals of MDR are to encourage young people to pursue interests in math, science, engineering and technology that will be essential for Muncie and Delaware County to have full access to the economic opportunities of the 21<sup>st</sup> century. These goals focus on discovery, learning and engagement of young people in math, science, engineering and technology.

Muncie/Delaware Robotics also encourages students to become leaders and mentors who set positive examples to the younger members, helping them to become community leaders of the future.

### **Goal 1 — Discovery**

Characteristics:

- Discovery in the forms of problem-solving, testing and trial and error
- Leadership in the applied sciences, technology, engineering, and other technological endeavor
- Leadership in peer relations, communication skills, and teamwork
- Significance and heightened awareness of issues of citizenship and community, including local and regional perspectives
- A stimulating and supportive, infrastructure that includes informational, technical, facility, and human resources
- Collaborative endeavors
- Mentoring programs and active involvement of adults and undergraduate students in education of younger peers. A diverse yet cohesive environment where teachers, mentors, and students, engage in a rich mix of human and intellectual activities

### **Goal 2 — Learning**

Characteristics:

- Student-centered educational programs, strengthened by breadth and depth in off-season curricula (workshops, training, tours, outreach and other opportunities) that prepare students to be innovative and to excel in their future academic and professional pursuits
- Encourages competencies of students in critical thinking, problem-solving, communication skills, information literacy, information technology, and methods of inquiry; teaching students how to learn

- A hands-on learning environment that fosters human and academic diversity, promotes interactive, experiential, interdisciplinary, individual, and team-based learning, and develops a commitment to a lifelong search for knowledge and wisdom
- Enhanced mentor involvement in hands-on learning, and excellence in improving learning outcomes
- Educational enrichment opportunities through programs and services that foster leadership and illuminate and demonstrate their relevance to life experiences

### **Goal 3 — Engagement: Address needs of society through engagement**

#### Characteristics:

- Effective partnerships with public and private agencies and organizations as well as disciplines within Delaware County and community to respond to a need for future technology-based economic development
- Leadership initiatives that improve mentor involvement with technology-based community programs
- Responsive civic engagement that addresses community involvement, professional development, technology education, and lifelong learning needs of the citizens of East Central Indiana
- Integration of MDR program engagement initiatives with its discovery and learning missions

### **Objectives**

The objectives of the MDR program include:

- Recruiting
- Career Development
- Program Development
- Marketing
- Fundraising & Financial Sustainability
- Program Sustainability

#### Recruiting

- Create a successful team of 15-20 students and seven mentors for each year
- Retain eligible students and mentors for the next year's program at a rate of at least 85%
- Start an Elementary Outreach feeder program using High School students teaching robotics with Lego Mindstorm kits
- Establish contacts and potential mentors within each high school in Delaware County
- Increase contacts to include middle and elementary schools by 20% each year.

#### Career Development

- Direct students toward STEM-based careers in Delaware county

#### Program Development

- Establish a network of teachers, mentors, and professional engineers to mentor the team
- Establish youth outreach summer program that will service "at risk" youth
- Effectively distribute information and opportunity to low-income students

## Marketing

- Win at least one competitive FIRST award
- Hold demonstrations/tours/open house for sponsors, schools, community
- Develop a presence in community (through creation of New Year's Eve Ball for Downtown Muncie)
- Publish program information, activities, and awards on website and in local newspapers

## Fundraising & Financial Sustainability

- Obtain funding to support of the team and establish long-term funding sources.
- Obtain \$5,000 in scholarships for team participants
- Establish a donation network of local businesses, retailers, and other sources in Delaware County
- Acquire \$100,000 of new funding through corporate, private charities and government financial support over the next three years.

## Program Sustainability

- Grow the team to forty students and 15 mentors in three years
- Develop a similar program for middle-school youth as feeder program for high-school program.

## Strategy and Actions

Through the partnership of mentoring adult professional engineers, teachers and other mentors, young people in Delaware County have a unique opportunity to gain knowledge and skills which can be applied not only to their own growth and careers, but to those of their local community as well. Muncie/Delaware Robotics provides opportunities for local youth to help bridge the need to develop technological and problem solving skills required to increase technology careers in Delaware County and Indiana.

### Key Strategies Specific to Goal 1 - Discovery

1. Make available the MDR program to all students interested in technology

#### *Metrics*

- Develop a strong program presence in the community and schools by holding team events, displaying robot, team awards;
- Obtain local press coverage of team activities, competitions, awards
- Inform guidance counselors and teachers who can direct students to the program

2. Create incentives that encourage mentors to participate in program

#### *Metrics*

- Release time for faculty involved with program
- Bonus or end-of-year 'credit' for time served
- Service time as community service on career vita

3. Undertake new areas of applied technology for achieving research and scholarship

### *Metrics*

- FIRST Delphi “Driving Tomorrow’s Technology” Award - Celebrates an elegant and advantageous machine feature.
- FIRST General Motors Industrial Design Award - Celebrates form and function in an efficiently designed machine that effectively achieves the game challenge.
- FIRST Imagery Award - Celebrates attractiveness in engineering and outstanding visual aesthetic integration of machine and team appearance.
- Autodesk Visualization Award - Presented by Autodesk, Inc. and recognizes excellence in student animation that clearly and creatively illustrates the spirit of the *FIRST* Robotics Competition.

### **Key Strategies Specific to Goal 2 — Learning**

1. Increase opportunities for student-led projects, outreach and student participation in hands-on instruction. Expand diversity of staff to cover various projects and programs. Expand mentor, teacher, student, and professional staff to allow for diversity of teaching styles, expertise and teaching abilities

#### *Metrics*

- Encourage student lead lessons and events at schools, corporations, community events
  - Encourage sponsoring corporations to provide a mentor during Build Season
  - Encourage students to participate in off-season formalized instruction via internships, co-operative opportunities, etc.
2. Facilitate student learning through introduction of innovative instructional methodologies and integration of technology into instruction

#### *Metrics*

- Tour local and regional facilities demonstrating technology integration
3. Systematically conduct periodic program self-studies that assess learning outcomes and student success

#### *Metrics*

- Retention and graduation rates (years to degree for students)
  - Students’ career placement and advanced study enrollment
  - Number of students receiving honors and awards
  - Student learning outcomes assessed at the program level by mentor queries, handouts, end-of season survey
4. Develop and implement workshop and curriculum strategies to ensure students’ competencies

#### *Metrics*

- Selection/development of workshop courses to provide content for competencies
5. Expand student learning opportunities and increase student participation in service learning; experiential, collaborative, programs; career development programs

*Metrics*

- Number of opportunities/programs and student participants
6. Continue to implement a participation strategy consistent with Team resources

*Metrics*

- Students-to-faculty ratio and team size
  - Educational and general expenditures per student
7. Expand opportunities for personal growth and leadership development through team activities and student support programs

*Metrics*

- Number of student participants in programs
- Community outreach programs

**Key Strategies Specific to Goal 3 – Engagement (Address the needs of society through engagement)**

1. Develop an organizational structure for making available students of technology to engage key local, state, and national constituencies to increase technology education, technology growth in the community and future economic development for Delaware County

*Metrics*

- Evaluate effectiveness of operational structures through a survey of mentors and constituents
  - Assess mentor involvement in engagement activities
2. Increase partnerships to enhance commercialization of research, entrepreneurial initiatives, support for startup companies

*Metrics*

- Number of technology-based companies involved with program
  - Number of start-up companies with alumni, mentors
  - Number of regional technology centers with team alumni
  - Number of partnerships
3. Strengthen preparatory education through enhanced, ongoing engagement with Pre K-12 schools, with special emphasis on math, science and technology

### *Metrics*

- Number of schools with technology programs, including FIRST and other similar technology programs
  - Number of schools, school visits, and students served
4. Educate, retain, regain, and retrain the upcoming workforce in targeted fields with skills necessary to increase technology-based programs in East Central Indiana

### *Metrics*

- Graduates' career placement and retention in Indiana and in the state's key economic clusters
  - Enrollment in workforce and continuing education, and lifelong learning programs
5. Develop and implement a vigorous program of internal and external communications designed to market the MDR program and its participants and enhance the impact of discovery, learning, and engagement

### *Metrics*

- Number of companies/employers/colleges selecting students as "recruiters' choice" for employment or secondary education
  - Appearance of Robotics program accomplishments and expertise in local and regional media
  - Success in fundraising
6. Enhance MDR student alumni relations by cultivating alumni interests, increasing communication, and involving alumni and patrons in MDR programs

### *Metrics*

- Number of student alumni and mentors engaged in technology-based programs
- Number of student alumni and mentor interactions with current students
- Participation rate of student alumni as mentors and donors to the program

## **Outcomes**

Students in Delaware County will be contributing members of the growing technology-based 21<sup>st</sup> Century. Technology and problem-solving is a growing part of the future, and MDR can be a part of that future by helping students see what they can do with their lives. The skill sets they develop through MDR program will enhance their opportunities for careers in technology, employment in East Central Indiana, the state of Indiana and beyond. By developing a strong bond to local mentors, businesses, students may be more likely to remain or return to this area. Post-secondary opportunities including entrepreneurial efforts can also be the result of creating this strong bond with local youth.

## **Benchmark Measures**

Assessment and evaluation of Metrics will occur on an annual basis with an Annual Progress Report on the Strategic Plan. Adjustments will occur as dictated by the evaluation.

## **Funding the Plan**

Muncie/Delaware Robotics has initiated a Fall Fundraising campaign that focuses on using the local companies and businesses to collect donations to help educate high school youth in Delaware County.

Personal contacts and mailings have been sent to technology-oriented companies, including, but not limited to computer technology, mechanical technology, digital technology, information technology, and machinery. Corporations which have donated in the past will be re-contacted to determine the level of contributions, mentor involvement, in-kind donations, etc. Fundraising is an on-going effort, with peak activity for fundraising taking place in the fall of each year.

In return, sponsors and donors of MDR get a visible commitment to local youth, and the opportunity to come and see what we are doing firsthand. Sponsors will have exposure to some of the top engineers and engineering firms in the country. Company logo will be displayed on the team robot, banners, and/or shirts, depending on donation level. Media coverage in the past included several newspaper articles, local television highlights, web-casts, and event national satellite television highlights.

(See attached budget for details)

## **Timeline**

This Strategic Plan will be implemented from 2007 – 2012, at which time the Program should be self-sustaining. It is estimated that the number of students who can benefit from services from MDR program will increase during the next five years.

## **Statement of Integrity**

To fulfill its goals as a learning community, Muncie/Delaware Robotics insists that the objectives of student learning are not compromised. It will treat all students equitably, and its evaluations of learning achievements are impartial based on demonstrated performance.

The students will understand that learning is the most important goal and will embrace ethical values and principles, and reject dishonesty in all our learning endeavors. In the realm of new discoveries, MDR places the highest value upon truth and accuracy, acknowledges the contributions of others, and places a higher value on expanding and sharing knowledge than on recognition or ownership.

Muncie/Delaware Robotics pledges to make wise use of its resources and to be good stewards of financial, capital, and human resources. The organization will operate within the letter and spirit of the law and prescribed policies, and strive to avoid impropriety or conflict of interest.

As members of the FIRST community, MDR demonstrates unyielding and uncompromised integrity in support of the highest standards of excellence. Individuals in the program all contribute to Muncie/Delaware Robotics standard of integrity as an exemplary model for all FIRST teams.

## Legal Entity

Muncie/Delaware Robotics Inc. is a 501c3, Indiana nonprofit corporation, DLN# 17053219039037; EIN: 72-1620450, effective 14 August, 2006, and is eligible for Public Charity Status Form 170.

## Citations

“Kids Count in Indiana”, The Indiana Youth Institute, 2006, *Economic Well-being for Delaware County*, [http://www.iyi.org/kids\\_count\\_data/pdf/datapdfs/delaware.pdf](http://www.iyi.org/kids_count_data/pdf/datapdfs/delaware.pdf)

International Technology Education Association (ITEA), *Standards for Technological Literacy: Content for the Study of Technology*, 2000, vii. Reprinted 2002, 258 pages.