The Results Are In!
Students Are Going Into the Aerospace and Defense Workforce!

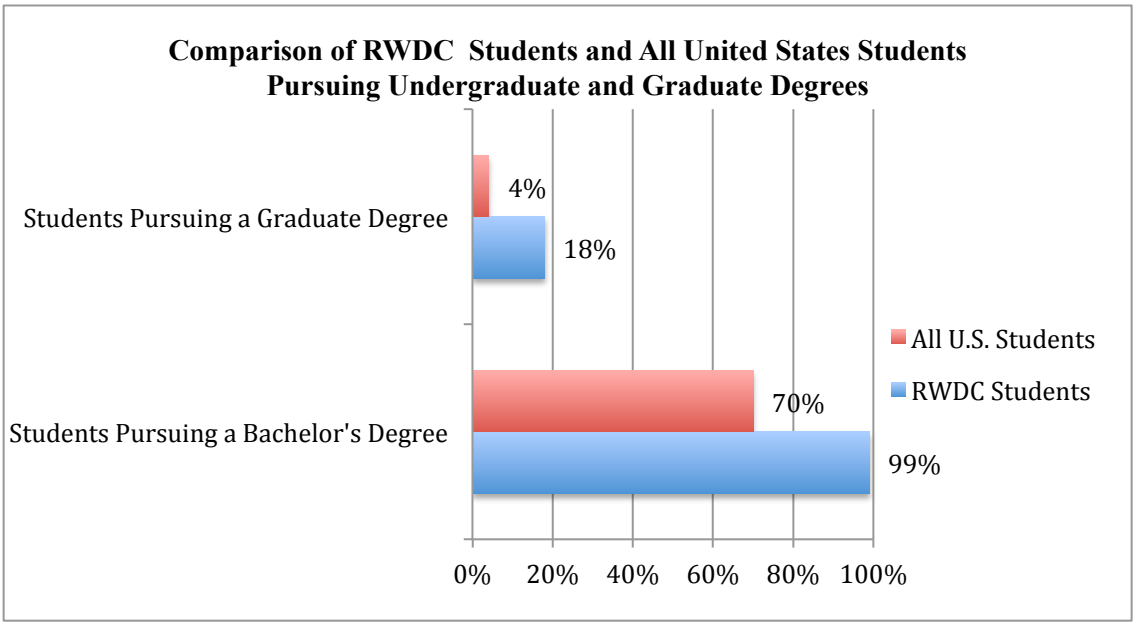
Ralph K. Coppola & Jeffrey V. Coppola
Real World Design Challenge, Vienna VA 22180
Robert W. Deters,
Embry-Riddle Aeronautical University Worldwide, Daytona Beach, FL 32114

I. Executive Summary

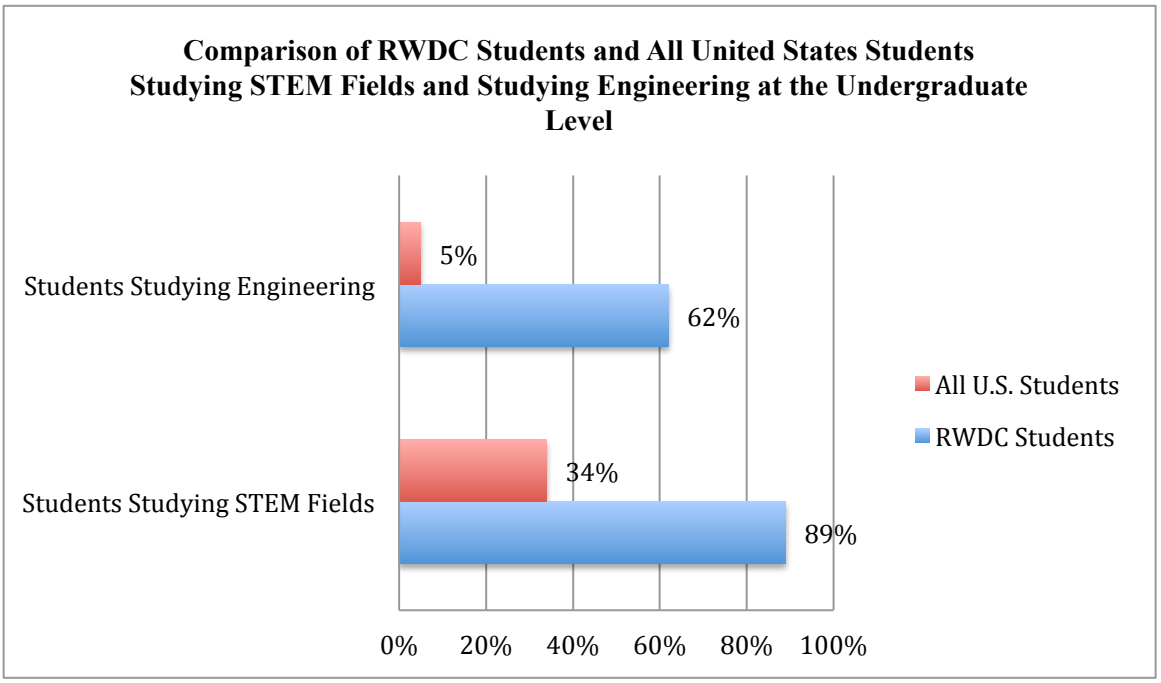
The Real World Design Challenge (RWDC) began in 2008 and is in its tenth year of implementation, and the results are in. RWDC alumni are ready for employment in STEM fields. The RWDC was created to help build the United States STEM workforce with a focus on aerospace and defense. The RWDC is identifying and preparing some of the best STEM talent in the U.S. Through a rigorous academic program and judging process, the RWDC is building a pipeline of the "best and brightest" students that will become STEM professionals. The RWDC supports Science, Technology, Engineering and Mathematics (STEM) education in high schools through an annual competition that provides students with the opportunity to apply the lessons of the classroom to the technical problems currently faced in the engineering field; thus, the academic goal of the RWDC is to motivate and prepare students for the STEM workforce and teach innovation. With training and support by mentors, students learn the technical elements of aircraft design. Through their participation in RWDC each year students develop STEM and business skills through work on an engineering problem.

A number of RWDC students are already working in STEM jobs in aerospace and defense. RWDC students have demonstrated that they are prepared to be the innovators of tomorrow. RWDC has impacted students in the following ways: (1) built confidence; (2) prepared them in engineering; (3) helped focus careers in engineering and STEM fields; and (4) opened doors to many education and career opportunities. RWDC has provided these kinds of results for both advantaged and disadvantaged students. RWDC staff are tracking students through their university study and working with employers to guide them into the STEM workforce where they are needed.

There are no prerequisites for admission to the RWDC other than the students being in grades 9-12. Participation is based on student choice. RWDC students perform at higher rates when compared with all students in the United States. The data represented in the following charts are from the RWDC longitudinal study (n=125) and the U.S. Department of Education National Center for Education Statistics *Digest of Education Statistics* (2018). Of all U.S. Students, nearly 70% are enrolled in higher education at the undergraduate level while 99% of the RWDC students are pursuing or obtained a bachelor's degree. RWDC students had a 29% higher rate of engaging in higher education at the undergraduate level than all U.S. students. When graduate degrees are compared (master's and doctoral degrees), 4% of all U.S. students who obtained bachelor's degrees pursued graduate degrees while 18% of RWDC students who obtained bachelor's degrees went on to pursue graduate degrees. RWDC students had a 14% higher rate of pursuing graduate degrees than all U.S. students that obtained bachelor's degrees.



Of all U.S. students, only 5% obtained bachelor's degrees in engineering while 62% of RWDC students obtained bachelor's degrees in engineering. RWDC students had a 57% higher rate of obtaining bachelor's degrees in engineering than all U.S. students. When STEM fields are compared, it was found that 34% of all U.S. students obtained bachelor's degrees in STEM fields while 89% of RWDC students obtained bachelor's degrees in STEM fields. RWDC students had a 55% higher rate of obtaining bachelor's degrees in STEM fields than all U.S. students.



The RWDC is meeting its objectives of: (1) Requiring a high level of academic rigor in solving Challenge problems; (2) Employing a rigorous judging process to help identify the best and brightest students; and (3) Linking RWDC alumni with STEM job opportunities.

It was found that there are two key intervention points in the STEM pipeline: (1) having an in depth, academically rigorous STEM experience in high school provides students with a focus directed toward STEM and in this case engineering and (2) the initial job students obtained after completing university study set the trajectory for their careers.

RWDC students have received excellent academic preparation. They have obtained "real world" experience at the education level. They are prepared for and are obtaining STEM jobs in aerospace and defense. The program is helping focus students' academic study in STEM as they move into higher education. The RWDC staff are actively working with employers to address the STEM workforce need, by matching RWDC alumni with job opportunities.

II. Overview of the Real World Design Challenge

Mission: The RWDC was created to help build the U.S. STEM workforce with a focus on aerospace and defense.

Goal: Develop high quality students to enter the STEM workforce.

In alignment with the America Competes Act, the RWDC works to invest in innovation through research and development and to improve the competitiveness of the United States (ACT, 2018). The RWDC was created to help build the U.S. STEM workforce in a scalable manner with a focus on aerospace and defense. The RWDC is identifying and preparing some of the best STEM talent in the U.S. Through a rigorous academic program and judging process, the RWDC is building a pipeline of the "best and brightest" students that will become STEM professionals ready for employment. The RWDC supports Science, Technology, Engineering and Mathematics (STEM) education in high schools through an annual competition that provides students with the opportunity to apply the lessons of the classroom to the technical problems currently faced in the engineering field; thus, the academic goal of the RWDC is to motivate and prepare students for the STEM workforce and teach innovation. The RWDC is "Real World" in the following ways: Students (1) solve Real Problems; (2) use Real Tools; (3) play Real Roles; and (4) make Real Contributions. With training and support by mentors, students learn the technical elements of aircraft design. Through their participation in RWDC each year students develop STEM and business skills through work on an engineering problem. Teams develop technical writing skills by documenting their work in an 80-page *Engineering Design Notebook*, which is evaluated by professionals in engineering.

III. Need

The aerospace and defense industry is a critical part of the U.S. economy and national security and is an example of an industry that is being affected by a dearth of STEM workers. It is projected that 39% of aerospace companies predict a significant STEM workforce shortage and many of the potential employees do not have technical competencies in technology fundamentals and professional skills such as problem-solving, critical thinking, literacy, and teamwork skills such as the ability to communicate and collaborate (AIA, 2016). There is a massive competencies gap between what is needed in engineering and manufacturing jobs and the competencies produced by STEM education (AIA, 2016). For more than a decade, education and business professionals have emphasized that STEM education is the key to U.S. economic success and the "STEM pipeline" is a pathway to such success. Students are unaware or may even be misinformed of what competencies are needed to be successful in the STEM fields. Young people need to be fully aware of the skills and knowledge needed for a STEM career in order to successfully prepare for that career (Lent, Brown, & Hackett, 1994).

IV. Background

The RWDC is the result of two years of research on how best to address the STEM workforce need. The PTC-MIT Consortium, a group of 80 organizations from business, government and education focused on addressing the STEM workforce, examined numerous studies and organized a series of events to obtain information and recommendations on how to best motivate and prepare more students to enter STEM fields. The following events were organized to obtain perspectives beyond the studies that were examined that led to the design of the Real World Design Challenge. They included: (1) *Moving Beyond the Problem—Strategic Next Steps for Enhancing the STEM Workforce,* hosted by Senator Mike Enzi and Senator Edward M. Kennedy, March 31, 2006, U.S. Capitol; (2) Congressional Reception and Poster Session: *STEM: Education for the Future: How American Educators Integrate the T&E into K–16 Classrooms,* hosted by the Senate STEM Education Caucus and the House STEM Education Caucus, July 12, 2006, Rayburn House Office Building; (3) Business/Industry/Education Focus Group: *Identifying Workforce Needs for the Aerospace/Defense/Industry,* Needham, Mass., July 13, 2006; and (4) *Taking Action Together,* a forum focused on addressing the needs of the T&E workforce. The *Taking Action Together* Forum was held at the National Academy of Engineering brought together 150 key stakeholders from government, industry and

education and resulted in the report *Preparing for the Perfect Storm A Report on the Forum Taking Action Together: Developing a National Action Plan to Address the "T&E" of STEM,* November 1, 2006.

The research that impacted the design of RWDC included the finding that industry wanted STEM employees that possess an excellent academic background and seven to ten years of "real world" experience. It also became clear simply preparing students in STEM was a minimum level of what was required. It was necessary to prepare the next generation of innovators. It was also clear that it was necessary to learn innovation in the context of learning the engineering design process. The name "Real World Design Challenge: The Innovation Engine" was chosen based on the research and the goals set for the program. When industry leaders were asked, "what do you want in the workforce?" they responded that they wanted people with "excellent academic preparation" and seven to ten years of "real world experience." When industry leaders were asked if it was possible provide the "real world" experience to the students at the education level, they responded in the affirmative. So one of the program goals was to design a program that provided "real world" experience at the education level. If this goal could be accomplished it would be possible to cut almost ten years off the STEM pipeline. You cannot teach engineering without teaching the engineering design process. That is why the word "Design" is in the name of the program. In order to have students rise to higher levels of achievement it was necessary to "challenge" the students with an academically rigorous problem and have them compete to come up with the best solution. Thus the word "Challenge" was included in the name of the program. Another program goal was to develop the next generation of innovators by design. Today innovation has happened in society by chance. People like Bill Gates and Steve Jobs emerged, as innovators by chance. They are examples of people that have had a significant impact on society. Innovation drives the creation of wealth in society. The RWDC was developed to create innovators by design thus increasing the number of innovators. That is why the tag line "Innovation Engine" was included.

Industry needs, research and best practices from other efforts, as well as many decades of RWDC staff and partners' experience in the design of successful education programs have also been incorporated in the design of the RWDC.

V. Description of the population served

The RWDC is a National/International Program with students participating from all 50 U.S. states, some U.S. territories, and additional countries. To date there have been 22,000 students that have participated in the program. On the average, 445 high school teams participate each year. Women and minority students are targeted in recruitment but the program is open to all students. Students from public, private and home schools are eligible to participate, as are students involved in clubs and extra-curricular activities such as Science & Technology Clubs, Boy Scouts and Girl Scouts. Students must be enrolled in a high school program and be in grades 9-12. In the first year, the National Champion Team was an all girl team from Hawaii and the 2014 National Champion Team from the Commonwealth of the Northern Mariana Islands was completely composed of Pacific Islanders and was an almost all girls team (there was one boy). It was the first time anyone from the Northern Mariana Islands won a National STEM Competition.

The data in charts 1, 2 and 3 are a one-year snap shot from 2014 that is representative of the program demographics from the program evaluation. The RWDC has had a 31% rate of female participation and a 69% rate of male participation. When grade level participation is examined the largest involvement was from 12th graders at 42%. Participation from grade 11 was 24%, participation from 10th grade was 15% and 9th grade participation was 19%. It should be noted that students might participate for as many as four years during their high school career. While 43% RWDC students came from suburban schools; RWDC students in urban schools were represented at 31% and RWDC students in rural schools were at 26%.

Chart 1: RWDC Male/Female Involvement

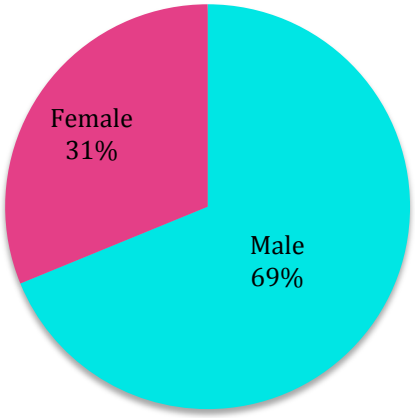


Chart 2: RWDC Student Grade Levels

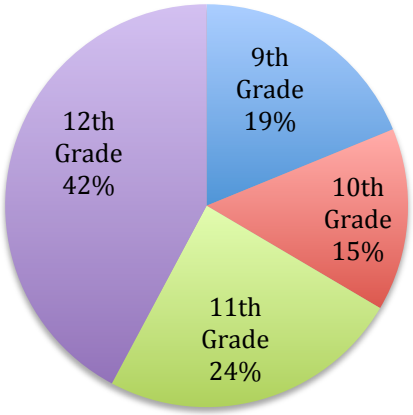
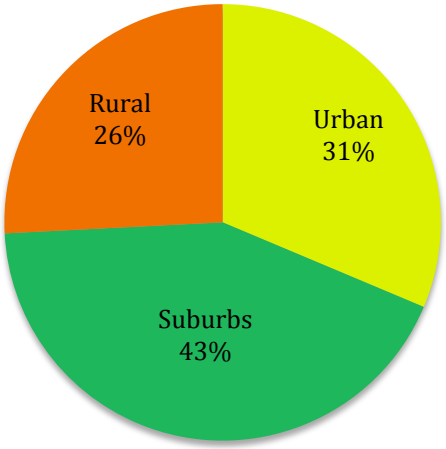
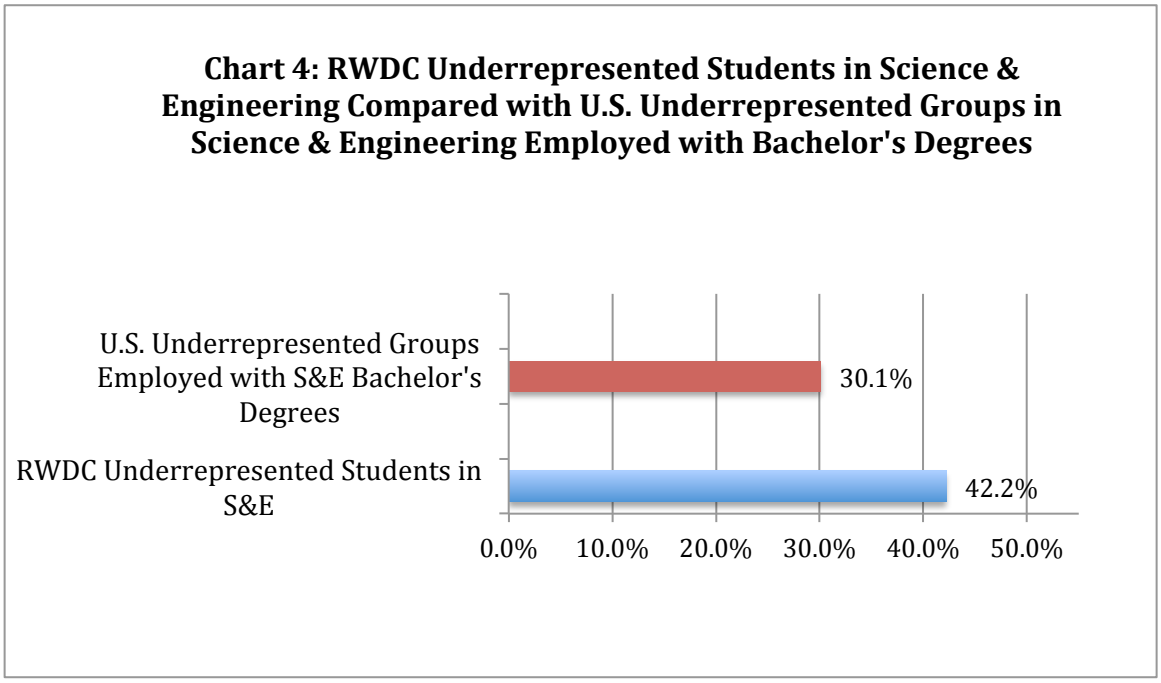


Chart 3: RWDC Student Geographic Locations



Most RWDC students go on to higher education and many take jobs in STEM or business. So a comparison between those underrepresented in Science & Engineering (S&E) with those who are working in S&E, with a bachelor's degree, shows an interesting comparison: 42.2 % of the RWDC students are in groups underrepresented in S&E while students across the United States who are underrepresented in S&E and employed with bachelor's degrees represent only 30.1% (See Chart 4). The data are from the RWDC annual student survey (the data are a one year representative sample of ten years of data, n=225) and the *National Science Board Science and Engineering Indictors* 2018 (NSB *S&E Indicators*, 2018).



VI. Geographic Area Served

The RWDC is a national program. Students from all fifty states and territories are eligible to participate. The RWDC has also expanded internationally. China is the first International Partner Country. However, the data represented in this paper only reflect information on U.S. students.

VII. Objectives

Objectives: (1) Prepare students for university study in STEM fields; (2) Prepare students for the STEM workforce; and (3) Assist students in gaining employment in the STEM workforce by linking them with employers.

VIII. Plan to meet the objectives

Objectives are met in three ways: (1) Requiring a high level of academic rigor in solving Challenge problems; (2) Employing a rigorous judging process to help identify the best and brightest students; and (3) Linking RWDC alumni with STEM job opportunities.

1. Academic rigor

The RWDC requires a high level of academic rigor from the high school student teams. The types of Challenges students learn how to solve are not often introduced until the junior or senior year in undergraduate engineering programs. The RWDC provides webinars, training and access to mentors to assist high school student teams in learning how to solve complex real world aviation problems. Students learn how to apply the engineering design process and use STEM skills in the context of learning how to come up with innovative solutions. Since the beginning, the Challenges have always focused on aviation. The topics of the earlier challenges varied and included the design of a business jet, the design of light sport aircraft and the design of a new wing for the Boeing 737 using aeroelastic tailoring. The RWDC Blue Ribbon Judges, many of whom are senior executives in the aviation industry, suggested that the focus change to Unmanned Aircraft Systems (UAS), since it is the biggest area of innovation in aviation today. That advice was followed and since 2013, the focus of the challenges has been on UAS design.

These are examples of representative Challenges the high school student teams have solved over the years.

The 2010 Challenge

Design the exterior geometry and internal structure of an airliner wing using aeroelastic-tailoring methods to minimize the objective function by varying specified design variables without violating constraints. The final design must: Balance the aircraft gross weight and wing lift at the cruise design point of 36,000 feet at Mach 0.70. Adjust the wing angle of attack until wing lift is equal to gross weight. Perform a static aeroelastic solution sequence using Pro/ENGINEER, FloEFD.Pro, and Mechanica to update aerodynamic loads on the deflected geometry. Not exceed material design allowables at the ultimate load factor at the cruise design point of 36,000 feet at Mach 0.70. Adjust the wing angle of attack until lift is equal to 3.75 times the gross weight. Perform a static aeroelastic solution sequence using Pro/ENGINEER, FloEFD.Pro, and Mechanica to update aerodynamic loads on the deflected geometry. Critical speed for flutter must be greater than 370 KEAS (knots equivalent airspeed) at an altitude of 30,000 feet. Perform the Pro/ENGINEER, Mechanica, Nei Nastran and ZAERO solution sequence to calculate flutter speed.

The 2018 Challenge

Design unmanned aircraft systems, create a theory of operation, and develop a business plan for the commercial operations of the system based on the following scenario. Your Company has been tasked with making a case whether or not the FAA part 107 regulations are restricting the ability to improve crop yield while minimizing profits. You will be comparing your aircraft to two aircraft that do precision agriculture in the United States. Your UAS design should perform spraying and/or surveying better than the one or both of the aircrafts given. While you may choose to have capabilities of both UAS designs given in your design, you must do better than the DJI Agras MG-1 at spraying, do better than the eBee SQ at surveying, or do better at both. To demonstrate the abilities of your aircraft, you will be using the test field owned by your company. The field is 2 miles by 2 miles in size (2560 acres) and the crop is corn. It will also be assumed that you must provide your surveying and spraying as a service to the farmer, you may NOT say your business case is to sell the aircraft.

If you decide that your UAV will only take care of one of the 2 features done by the DJI Agras MG- 1 (spraying) or the eBee SQ (surveying), you will need to come up with a way of completing those tasks through traditional methods. For example, if you make a surveying UAV that is unable to do any spraying, you will need to research another method of getting the pesticide to the affected areas.

The cost of performing the additional tasks that your UAV design does not complete must be accounted for in your costs for servicing the field. You must however have at least one UAV that completes the survey and/or spraying tasks of the DJI Agras MG-1 (spraying) or the eBee SQ (surveying). You should be comparing your system to the given performances of the two given designs.

(2) Rigorous Judging

RWDC Teams go though a rigorous process of judging with the goals of evaluating academic performance and identifying the best and brightest students with the highest levels of achievement. Judges are volunteers from government, industry and higher education. The judging process has two major tiers. There is State/Province Level Judging and National/International Level Judging. All teams are judged at the State/Province Level to determine the State/Province Champions. State/Province Champions are invited to compete in the National/International Championship where a National Champions and an International Champion are chosen.

- State/Province Judges read and score the State Challenge *Engineering Design Notebooks* (80 pages). Judges use the *RWDC Scoring Rubric* to evaluate the *Engineering Design Notebooks* (the teams' solutions). The judging is done virtually. The State Coordinators determine the State Champion based on the scores and input from the State Judges.
- National/International Judges
  - Technical Judges read and score the National/International Challenge *Engineering Design Notebooks* (80 pages) two weeks before the National/International Championship begins. Judges use the *RWDC Scoring Rubric* to evaluate the *Engineering Design Notebooks* (the team's solutions).
  - Challenge Judges view team presentations at the National Championship and question the teams on their work. They also facilitate deliberation, scoring and ranking. They meet to share results and determine the top three teams and Merit Award Winners.
  - Blue Ribbon Judges view the top teams' presentations and determine the National and International Champions.

3. Linking RWDC Alumni with STEM Job Opportunities

The RWDC is going into the eleventh year of implementation. Many of the RWDC Alumni have or are finishing university study. Profile information on the students have been collected. Many aerospace and defense companies are looking for high quality STEM employees. RWDC is bridging the gap between the students and companies by making the resource of the best and brightest students available to companies

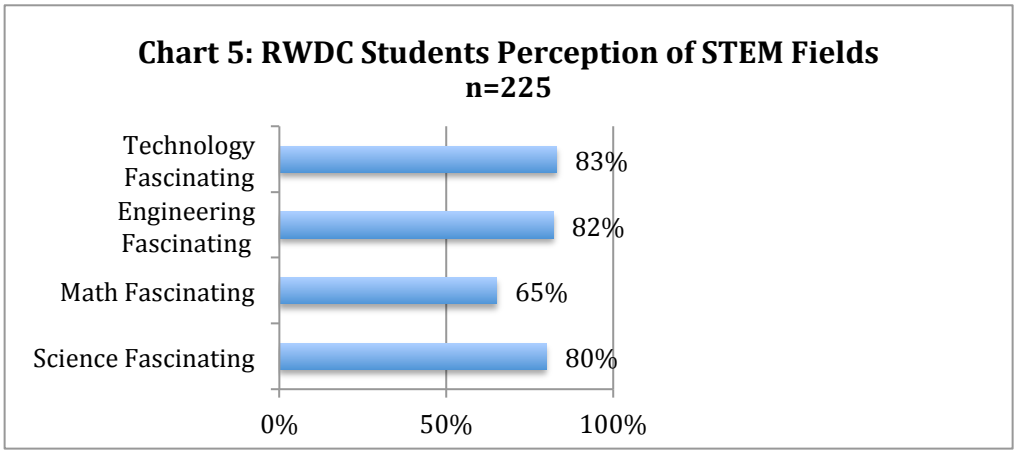
IX. Measuring Outcomes

There were two methods used to measure outcomes: (1) Student surveys were implemented annually to gain an understanding of interest in STEM and careers plans and (2) A longitudinal study was conducted to determine where students ended up after they graduated from the RWDC. University study, including major and the university attended were tracked. Graduate study and jobs obtained were also tracked, including type of organization and area of specialization. There was an examination of data on RWDC alumni LinkedIn pages; resumes that were provided by the alumni and phone interviews were conducted. For the RWDC student survey there was a sample of participating students. The survey sample size was 225. For the longitudinal study there was a sampling of the RWDC State Champion teams. The longitudinal study sample size was 125.

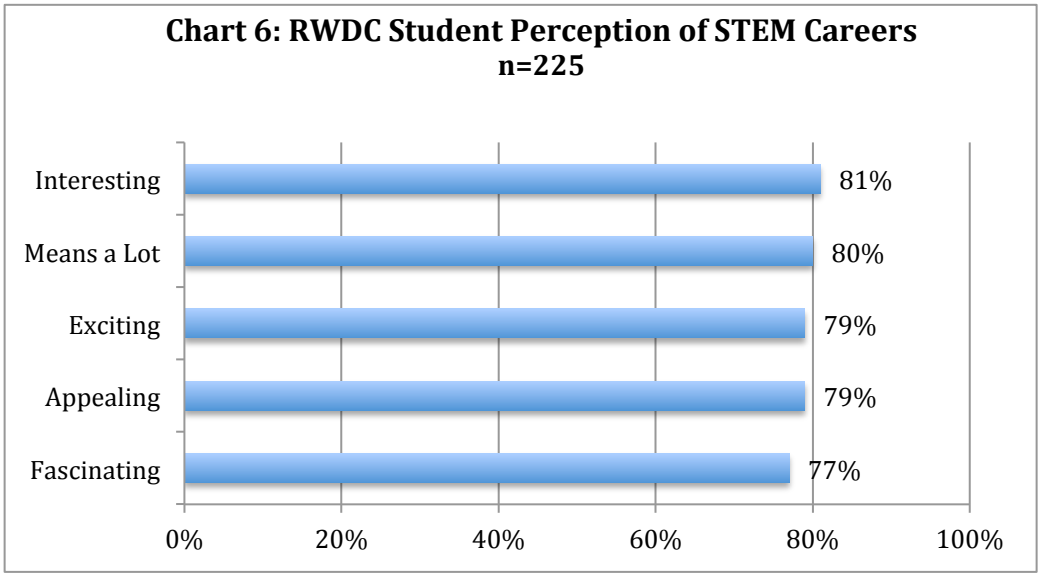
X. Outcomes

RWDC Student Survey Results: To date 2,974 teams with nearly 22,000 students have participated in the Challenge. Based on feedback from the RWDC Blue Ribbon Judges, who are executives from industry, government and academia they found that the RWDC students were performing at graduate student level in engineering. This was accomplished with 18 weeks of involvement in the Challenge. Many teams were motivated to work as many as 60 hours per week beyond class time on the Challenge.

RWDC student survey results are provided in Charts 5 and 6. Research staff at the Education Development Center (EDC) helped with the design of the survey instrument and the survey methodology. The RWDC STEM Semantic Survey was designed to assess student perceptions of STEM disciplines. Questions offered a range of responses on a Likert Scale with a seven point range from "Fascinating" to "Mundane"; "Appealing" to "Unappealing"; "Exciting" to "Unexciting"; "Means a Lot" to "Means Nothing"; "Interesting" to "Boring." The RWDC Student perceptions of STEM fields were mostly about 80% finding STEM fields "Fascinating." Math was the lowest score with only 65% of the RWDC students finding it "Fascinating."



When STEM careers were examined, on the average 79% rated these fields very positively as shown in Chart 6.



RWDC Longitudinal Study Results: These data are on students that have participated in the program over the ten-year period that the RWDC has been implemented. The findings of the RWDC longitudinal study are represented in Charts 7 and 8 and Tables 1, 2 and 3. These data clearly show that many RWDC students are entering the STEM pipeline, studying STEM fields and taking STEM jobs. The interviews of the RWDC alumni revealed other key information, which added color to the data. It was found that there are two key intervention points in the STEM pipeline: (1) having an in depth, academically rigorous STEM experience in high school provides students with a focus directed toward STEM and in this case engineering and (2) students also reported that the initial job they obtained after completing university study set the initial trajectory for their careers.

Based on interviews with RWDC alumni, the students said that the program contributed to their success in the following ways: (1) it built confidence; (2) prepared them in engineering; (3) helped focus careers on engineering and STEM fields; and (4) It opened doors to many education and career opportunities. It has provided these kinds of results for both advantaged and disadvantaged students.

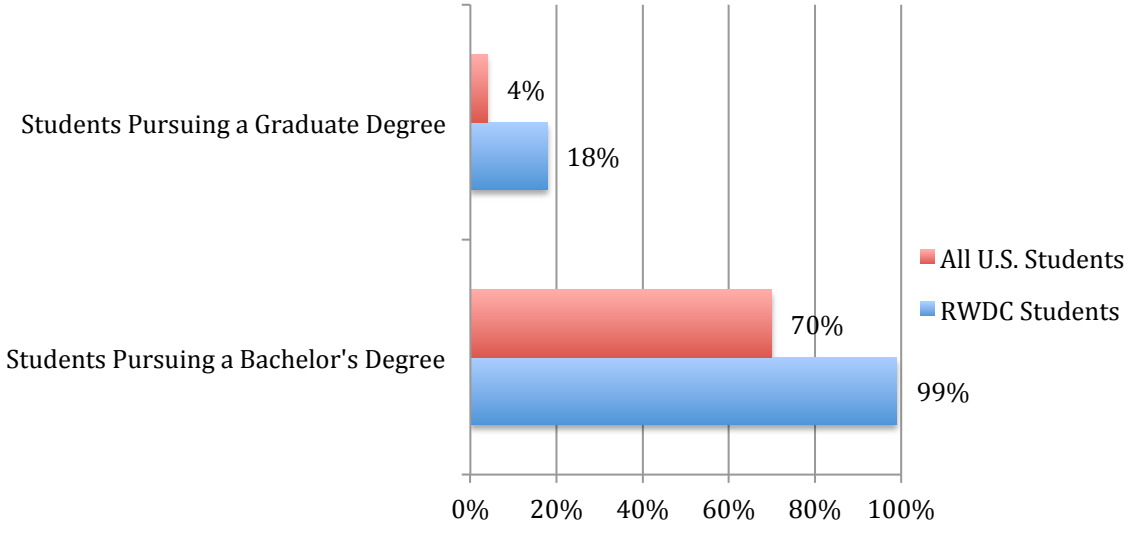
RWDC students' work on the design of their aircraft systems exhibited innovation and academic rigor. The following are some examples. One year The RWDC U.S. National Champion Team was working on a problem of aeroelastic tailoring. Their goal was to enhance the performance of a Boeing 737 by redesigning the internal and external structure of the wing. The teams' design out performed the original Boeing design. They incorporated a composite material they invented in the redesign of the wing. Another year teams where working on optimizing the design of a light sport aircraft by redesigning the tail of the plane. The U.S. National Champion Team that year considered 1,500 possible tail candidates. The team thought that was too much data to analyze so they designed an analysis spreadsheet tool to automate the analysis of the tail data. That approach had not been used by industry and saved a lot of time and money, as reported by the Vice President for Engineering at Cessna. Their approach was adopted by industry. Another year teams were working on the design of an Unmanned Aerial System (UAS) with the mission of precision agriculture. The U.S. National Champion team that year designed a UAS in six months with almost the same optimization result as a team of researchers from Princeton University and Rutgers University that did the same work in two and half years.

The students also indicated that the RWDC experience helped open doors to the best universities. One student reported that he was on an RWDC team that received the Secretary of Transportation's Raise Award. Having the award and working on an upper level undergraduate engineering project when in high school opened the door to admission to the Stanford University Engineering Program. Another RWDC student worked on an aeroelastic tailoring problem and published a paper on it while in high school. One female student from the Commonwealth of the Northern Mariana Islands (CNMI) received a Gates Millennium Scholarship from the Bill and Melinda Gates Foundation to support ten years of study. She has finished her undergraduate program and is now in a masters degree program in mechanical engineering and plans to continue work on a doctoral degree. She credits getting the scholarship to her work in the RWDC. Another RWDC student indicated that he got a job at the MIT Lincoln Labs in part due to the experience he obtained in the RWDC. Based on data and interviews, it appears that RWDC students who competed in multiple competition years where more likely to go on to graduate study in STEM than those who only participated for one year.

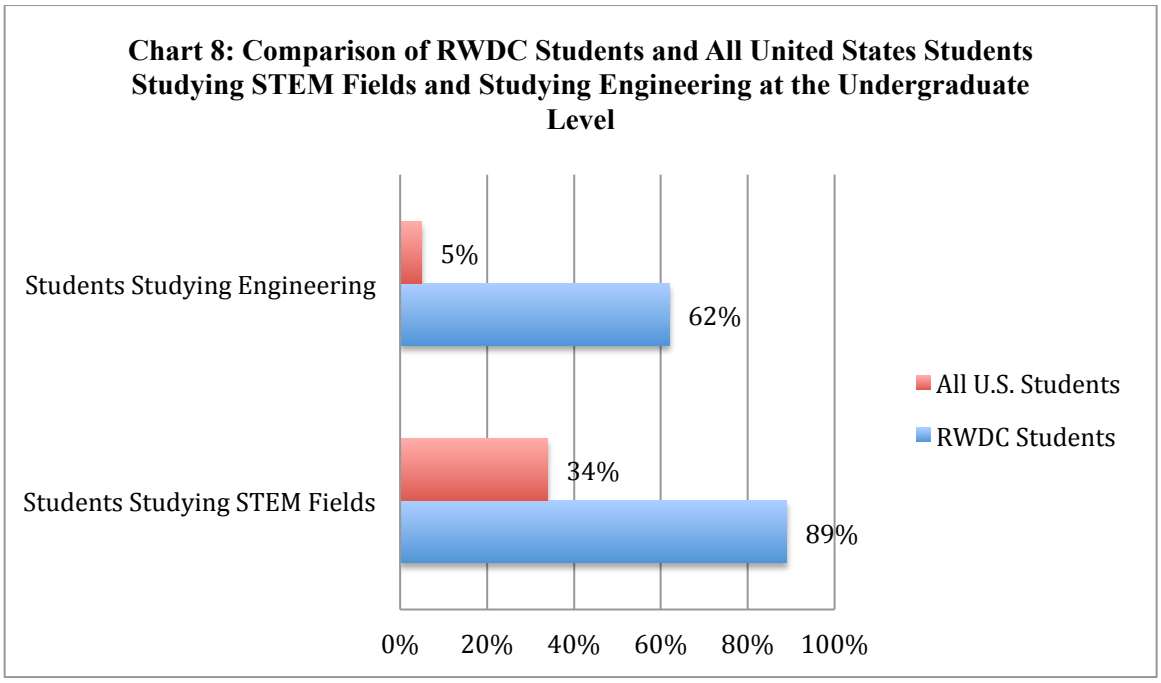
It is interesting to note that the survey data show that RWDC student interest in STEM ranges from 77% to 81% with an overall average of 79% but the percentage of RWDC students in STEM majors is higher at 89%. There was a 10% higher rate of RWDC students choosing STEM majors than their interest in STEM before participating in the program. This appears to be an indication that participation in the RWDC enhanced the students' interest in STEM careers and had an impact on their career choices to go into STEM careers.

There are no prerequisites for admission to the RWDC other than the students being in grades 9-12. Participation is based on student choice. RWDC students perform at higher rates when compared with all students in the United States. The data represented in the following charts are from the RWDC longitudinal study (n=125) and the U.S. Department of Education National Center for Education Statistics *Digest of Education Statistics* (2018). Of all U.S. Students, nearly 70% are enrolled in higher education at the undergraduate level while 99% of the RWDC students are pursuing or obtained a bachelor's degree. RWDC students had a 29% higher rate of engaging in higher education at the undergraduate level than all U.S. students. When graduate degrees are compared (master's and doctoral degrees), 4% of all U.S. students who obtained bachelor's degrees pursued graduate degrees while 18% of RWDC students who obtained bachelor's degrees went on to pursue graduate degrees. RWDC students had a 14% higher rate of pursuing graduate degrees than all U.S. students that obtained bachelor's degrees.

Chart 7: Comparison of RWDC Students and All United States Students Pursuing Undergraduate and Graduate Degrees



Of all U.S. students, only 5% took bachelor's degrees in engineering while 62% of RWDC students took bachelor's degrees in engineering. RWDC students had a 57% higher rate of obtaining bachelor's degrees in engineering than all U.S. students. When STEM fields are compared, it was found that 34% of all U.S. students obtained bachelor's degrees in STEM fields while 89% of RWDC students obtained bachelor's degrees in STEM fields. RWDC students had a 55% higher rate of obtaining bachelor's degrees in STEM fields than all U.S. students.



The following is a sampling of the institutions of higher education that RWDC alumni attended for undergraduate degree programs.

Table 1: Intuitions of higher education that RWDC Alumni attended for undergraduate study

Arizona State University	Georgia Institute of Technology	North Dakota State University	University of Alaska	University of Massachusetts	University of South Carolina	Virginia Polytechnic Institute & State University
Boston University	Harvard University	Northwestern University	University of California	University of Michigan	University of Southern California	West Virginia University
Brown University	Imperial College of London	Pennsylvania State University	University of Colorado	University of Minnesota	University of Texas	
Carnegie Mellon University	Iowa State University	Princeton University	University of Connecticut	University of Montana	University of Vermont	
Cornell University	Johns Hopkins University	Purdue University	University of Hawaii	University of Nevada	University of Washington	
Duke University	MIT	Rochester Institute of Technology	University of Houston	University of North Carolina	Vanderbilt University	
Embry-Riddle Aeronautical University	Northeastern University	Stanford University	University of Kansas	University of Pennsylvania	Villanova University	
Georgetown University	North Carolina State University	University of Alabama	University of Maryland	University of Pittsburgh	Notre Dame University	

The Following is a sampling of the intuitions of higher education that RWDC alumni attended for graduate study.

Table 2: Institutions of higher education that RWDC alumni attended for graduate study

Boston University	Iowa State University	University of California	University of Vermont
Brown University	Rensselaer Polytechnical Institute	University of Cambridge	Yale University
Carnegie Mellon University	Rutgers University	University of Kansas	
Cornell University	Stanford University	University of Minnesota	

A number of RWDC alumni are already in the workforce. The following are a sampling of the organizations where the RWDC alumni are working or have worked. Note: Aerospace and defense organizations are bolded.

Table 3: Organizations where RWDC Alumni are working

Accenture	**DJI**	Nei (analytical software)	Tesla
Amazon	**GE**	**Northrop Grumman**	**Textron Aviation**
Boeing	Goldman Sachs	**Pratt & Whitney**	**United**
Booze Allen Hamilton	Google	**Raytheon**	**U.S. Army**
Box	**Gulfstream**	**SAIC**	**U.S. Naval Research Lab**
Capital One	J.P. Morgan	Shell	
Chase	**Lockheed Martin**	**Space X**	
Chevron	Microsoft	**Sprit AeroSystems**	
Corning	**MIT Lincoln Labs**	**Sikorsky**	
Delta	**NASA**	3M	

XI. Conclusion

The RWDC is meeting its objectives: (1) Requiring a high level of academic rigor in solving Challenge problems; (2) Employing a rigorous judging process to help identify the best and brightest students; and (3) Linking RWDC alumni with STEM job opportunities.

RWDC students have received excellent academic preparation. They have obtained "real world" experience at the education level. They are prepared for and are obtaining STEM jobs in aerospace and defense. They have demonstrated that they are prepared to be the innovators of tomorrow. The program is helping focus academic study in STEM as they move into higher education. The RWDC staff are actively working with employers to address the STEM workforce need by matching RWDC alumni with job opportunities to help keep the trajectory of the students' careers on track in STEM fields by helping them connect with their first jobs in aerospace and defense.

XII. References

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