



City College of San Francisco
iDesign Summer Engineering Program (2009)
Final Grant Report
August 11, 2009

PROJECT

Brief summary of project and its goals

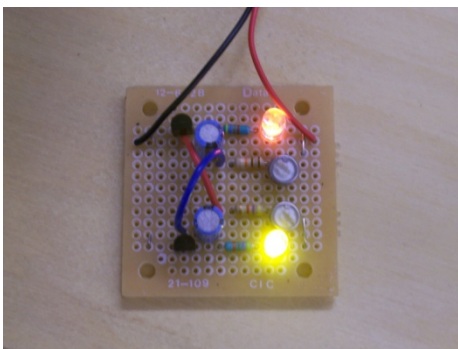
iDesign is a free, 2-week engineering program for high school students interested in technology. It is a hands-on course where students design, build, play, travel, take apart, and learn – all while having fun and learning how engineers help society. It was held from July 13 – 24, 2009 at the City College of San Francisco (CCSF).

The goal of the program is to excite and inspire students in careers in engineering. We are also encouraging students to consider City College of San Francisco as an option for engineering classes during, or after, high school. The program meets the requirements of the college's Engineering 48L course and all students receive one unit of CCSF credit upon completion.

This was the first year for the program. We had over 65 applications and enrolled 22 students – with twelve of these being girls (55%). All the students were going into their junior or senior years in local San Francisco high schools (Burton, Galileo, Gateway, Lowell, or Washington).

Schedule

The students met for 10 days (July 13 – 24) from 8:30 – 4:30 pm Monday through Friday. The course was a mix of projects (wind turbine, and electronic “Blinky” circuit), lectures, field trips, and guest speakers. We wanted the students to hear from engineers, and also see up close where and how they work.



Blinky project

A detailed schedule follows.

Assessment and analysis of whether intended outcome was realized

Our goal in the program was to excite the students about engineering, and give them information on how to pursue engineering as a career path. Based on responses from the students, we feel we achieved this goal. We received informal feedback from the students during the program and at the final presentations that indicated the students enjoyed iDesign and found it educational. In addition, we conducted a formal, anonymous survey the week following the program. The results of this are summarized in the Appendix, but some of the main points:

- *100% of the students would recommend the program to a friend.*
- *100% agreed (or strongly agreed) that iDesign was fun.*
- *94% agreed (or strongly agreed) that iDesign was educational.*
- *90% of the women, and 63% of the men said it strengthened their interest in pursuing engineering as a career (the remaining said it did not change their interest level).*

Some comments from the students:

"I loved that it was very hands-on and that we worked on different types of projects but still learned enough to work on it on our own. The teachers acknowledged our independence and let us make mistakes and learn from them. They told us what needed to be done and let us do it. The days were long but I never dreaded going. All in all, it was probably the most rewarding two weeks I've ever had. I wish it lasted longer."

"I loved the trips and speaking to people who are engineers for a living. They gave me a greater understanding of what engineering means and how to become one."

"I really like the hands-on projects we did. I had never done any of them and I learned a lot from doing them."

"The iDesign program was a great introduction to engineering and in discovering what engineering is all about. I've learned things I was never conscious of. The environment, the passion of the instructors and enthusiasm of the students were great and it contributed greatly to my first experience and exposure to engineering."

"It was so much fun and I learned more about what engineering entails than I ever have before. Anyone who thinks that they might be interested in engineering should attend. It gave me a broad overview of the different fields of engineering and helped me decide what I wanted to pursue."

"I never really thought about taking classes at City except for those I needed to fulfill high school requirements. Now, I'm considering taking a class during the school year. I wish I had realized this sooner. High school's almost over and my schedule is hard to work around. But still, I'm thinking about enrolling."

"The speakers are a wonderful addition to the whole experience. It allowed me to realize how being an engineer impacts and takes important roles in the future of the developing world. And the responsibilities that come with that growth."

Description of any unforeseen challenges and what was or will be done to address them

The biggest challenge came before the program started and dealt with funding. When we conceived of the program back in March of 2009, we made the decision to use money from various, already existing, educational grants to fund the program. We were able to pull the commitments together quickly, and we felt that this was

ideal for the first year of the program, because it would allow us to spend more time on curriculum development rather than raising funds.

However, with the California budget crisis, our funding was withdrawn. Once we received word that our grant funds were frozen and could not be used for iDesign, we began raising funds outside of the state grants. Thanks to the support of the Bechtel Foundation, Logitech, General Foundry, and the Stanford University Clayman Institute, we were able to support the program.

To address this issue for next year, we will seek out corporate funding from the start and we will start the fundraising process earlier (fall of 2009). We believe that with the success we've shown this year, and a solid understanding of the budget needs, we can find four to five corporations that can support the project in total.

Funding Sources (Total = \$26,500)

Bechtel Foundation	\$20,000
Logitech	\$5,000
Stanford University Clayman Institute for Gender Research	\$1,000
General Foundry	\$500

With expenses totaling \$24,700, we have approximately \$1800 in surplus funds after expenses. We will have a couple of uses for these funds:

- 1) We are looking at having a “reunion” day with the students during December break. Our thought is to have a local field trip, or have the students meet at a local research university (such as Stanford) and tour some of the engineering labs. Our goal is to maintain the students’ enthusiasm for the program, and to get the students talking about it amongst their friends – which will help us when we go recruiting for next year’s class. Funds might be used for transportation expenses or for lunch for the students.
- 2) Any remaining funds will be used for the 2010 iDesign program.

CONCLUSION

Summary

Based on the feedback from the students, we believe we have achieved the main goal of the program – which was to excite and encourage more students (especially young women) to pursue careers in engineering. During this first year of the program, we learned a lot and feel that there are many ways we can improve the program as we move forward.

Beyond the student feedback, we feel another measure of success was the response we had from industry. We received very positive feedback when we requested speakers and tours. While we received only two donations from companies (totaling \$5500), there was interest from others. Unfortunately, the short notice given the companies (combined with the current state of the economy) made it difficult for them to make a contribution in the time needed. However, we feel that next year we will be able to raise corporate funds necessary for the program.

Sustainability

Based on the positive feedback received from students and sponsors, we intend to offer this program again next year. From a logistics standpoint, we now have a baseline program to build upon, and this will make the organization of next year’s program much easier. In addition, the success of the program

in its first year will give us a compelling story to present when we begin looking for funding. We will start fundraising in the fall of 2009 for the 2010 summer program. We expect this longer lead-time, combined with what we hope will be a stronger economy, will enable us to raise the funds to run the program.

Outreach to Other Community Colleges

Our experience showed that there seems to be a pent-up demand for such an engineering program, and so we believe the success of iDesign is replicable at other community colleges throughout the state.

With this in mind, we intend to document the logistics of setting up the program, the budget, curriculum, difficulties encountered, things that worked, things that didn't, etc. so that if any other college would like to create their own iDesign, they will have a place to start. We will then disseminate this information on the web, and by speaking at local and statewide community college meetings. Our goal will be to get one to two programs started in 2010 at other California Community Colleges.

APPENDIX – SURVEY RESULTS

From anonymous online survey.

iDesign Student Feedback

1. Gender			
	Gender		
	Female	Male	Response Totals
Female	100.0% (11)	0.0% (0)	55.0% (11)
Male	0.0% (0)	100.0% (9)	45.0% (9)
<i>answered question</i>	11	9	20
<i>skipped question</i>			0

2. Tell us how fun and educational you think iDesign was. (Click on "Strongly Agree" if you had a lot of fun, and learned a lot in the program)

		Gender		
		Female	Male	Response Totals
iDesign was FUN	Strongly AGREE	81.8% (9)	22.2% (2)	
	AGREE	18.2% (2)	77.8% (7)	
	Neutral	0.0% (0)	0.0% (0)	
	DISAGREE	0.0% (0)	0.0% (0)	
	Strongly DISAGREE	0.0% (0)	0.0% (0)	
rating average		1.18 (11)	1.78 (9)	1.45 (20)
iDesign was EDUCATIONAL	Strongly AGREE	54.5% (6)	44.4% (4)	
	AGREE	45.5% (5)	44.4% (4)	
	Neutral	0.0% (0)	0.0% (0)	
	DISAGREE	0.0% (0)	11.1% (1)	
	Strongly DISAGREE	0.0% (0)	0.0% (0)	
rating average		1.45 (11)	1.78 (9)	1.60 (20)
COMMENTS		1 reply	3 replies	4
<i>answered question</i>		11	9	20
<i>skipped question</i>				0

3. What did you think of the FIELD TRIPS?				
		Gender		
		Female	Male	Response Totals
Berkeley Bionics	Excellent!	63.6% (7)	55.6% (5)	
	Very interesting	36.4% (4)	33.3% (3)	
	OK	0.0% (0)	11.1% (1)	
	Didn't like it	0.0% (0)	0.0% (0)	
rating average		1.36 (11)	1.56 (9)	1.45 (20)
UC-Berkeley	Excellent!	36.4% (4)	33.3% (3)	
	Very interesting	36.4% (4)	44.4% (4)	
	OK	27.3% (3)	22.2% (2)	
	Didn't like it	0.0% (0)	0.0% (0)	
rating average		1.91 (11)	1.89 (9)	1.90 (20)
General Foundry	Excellent!	27.3% (3)	44.4% (4)	
	Very interesting	72.7% (8)	33.3% (3)	
	OK	0.0% (0)	22.2% (2)	
	Didn't like it	0.0% (0)	0.0% (0)	
rating average		1.73 (11)	1.78 (9)	1.75 (20)

Makani Power	Excellent!	27.3% (3)	44.4% (4)	
	Very interesting	63.6% (7)	22.2% (2)	
	OK	9.1% (1)	33.3% (3)	
	Didn't like it	0.0% (0)	0.0% (0)	
rating average		1.82 (11)	1.89 (9)	1.85 (20)
UCSF Construction Site	Excellent!	45.5% (5)	33.3% (3)	
	Very interesting	54.5% (6)	44.4% (4)	
	OK	0.0% (0)	22.2% (2)	
	Didn't like it	0.0% (0)	0.0% (0)	
rating average		1.55 (11)	1.89 (9)	1.70 (20)
COMMENTS		2 replies	3 replies	5
<i>answered question</i>		11	9	20
<i>skipped question</i>				0

4. What did you think of the SPEAKERS?				
		Gender		
		Female	Male	Response Totals
Logitech (Mice, Webcams)	Excellent!	72.7% (8)	44.4% (4)	
	Very interesting	18.2% (2)	44.4% (4)	
	OK	9.1% (1)	11.1% (1)	
	Didn't like it	0.0% (0)	0.0% (0)	
rating average		1.36 (11)	1.67 (9)	1.50 (20)
Wild Planet (Toys)	Excellent!	72.7% (8)	55.6% (5)	
	Very interesting	18.2% (2)	22.2% (2)	
	OK	9.1% (1)	22.2% (2)	
	Didn't like it	0.0% (0)	0.0% (0)	
rating average		1.36 (11)	1.67 (9)	1.50 (20)
Stanford grad student	Excellent!	63.6% (7)	22.2% (2)	
	Very interesting	36.4% (4)	44.4% (4)	
	OK	0.0% (0)	33.3% (3)	
	Didn't like it	0.0% (0)	0.0% (0)	
rating average		1.36 (11)	2.11 (9)	1.70 (20)

Tesla Motors	Excellent!	81.8% (9)	66.7% (6)	
	Very interesting	18.2% (2)	11.1% (1)	
	OK	0.0% (0)	22.2% (2)	
	Didn't like it	0.0% (0)	0.0% (0)	
rating average		1.18 (11)	1.56 (9)	1.35 (20)
Structural engineer	Excellent!	72.7% (8)	22.2% (2)	
	Very interesting	27.3% (3)	55.6% (5)	
	OK	0.0% (0)	22.2% (2)	
	Didn't like it	0.0% (0)	0.0% (0)	
rating average		1.27 (11)	2.00 (9)	1.60 (20)
COMMENTS		3 replies	2 replies	5
<i>answered question</i>		11	9	20
			<i>skipped question</i>	0

5. TIME: Let us know if we used the time wisely				
		Gender		
		Female	Male	Response Totals
BLINKY Project	Too little time	0.0% (0)	11.1% (1)	
	About right	100.0% (11)	88.9% (8)	
	Too much time	0.0% (0)	0.0% (0)	
		11	9	20
DESIGN LECTURES (Mike & Mark)	Too little time	9.1% (1)	11.1% (1)	
	About right	54.5% (6)	55.6% (5)	
	Too much time	36.4% (4)	33.3% (3)	
		11	9	20
FIELD TRIPS	Too little time	27.3% (3)	11.1% (1)	
	About right	63.6% (7)	88.9% (8)	
	Too much time	9.1% (1)	0.0% (0)	
		11	9	20
SPEAKERS	Too little time	9.1% (1)	0.0% (0)	
	About right	90.9% (10)	100.0% (9)	
	Too much time	0.0% (0)	0.0% (0)	
		11	9	20

WIND TURBINE Project	Too little time	45.5% (5)	33.3% (3)	
	About right	54.5% (6)	44.4% (4)	
	Too much time	0.0% (0)	22.2% (2)	
		11	9	20
Overall IDESIGN Program (2 weeks)	Too little time	72.7% (8)	66.7% (6)	
	About right	27.3% (3)	33.3% (3)	
	Too much time	0.0% (0)	0.0% (0)	
		11	9	20
COMMENTS		3 replies	3 replies	6
answered question		11	9	20
			skipped question	0

6. Did iDesign help you in your decision to pursue engineering as a career?			
	Gender		Response Totals
	Female	Male	
It STRENGTHENED my interest in becoming an engineer	90.9% (10)	66.7% (6)	80.0% (16)
It LESSENEED my interest in becoming an engineer	0.0% (0)	0.0% (0)	0.0% (0)
It did not change my interest level	9.1% (1)	33.3% (3)	20.0% (4)
What type of engineering are you interested in pursuing? Why?	7 replies	6 replies	13
answered question	11	9	20
			skipped question
			0

7. Would you recommend the iDesign program to your friends interested in engineering?			
	Gender		
	Female	Male	Response Totals
Yes	100.0% (11)	100.0% (9)	100.0% (20)
No	0.0% (0)	0.0% (0)	0.0% (0)
Maybe	0.0% (0)	0.0% (0)	0.0% (0)
COMMENTS	4 replies	2 replies	6
<i>answered question</i>	11	9	20
<i>skipped question</i>			0

8. What did you like MOST about the iDesign program?			
	Gender		
	Female	Male	Response Count
	10 replies	9 replies	19
<i>answered question</i>	10	9	19
<i>skipped question</i>			1

9. What did you like LEAST about the iDesign program?			
	Gender		
	Female	Male	Response Count
	10 replies	9 replies	19
<i>answered question</i>	10	9	19
<i>skipped question</i>			1

10. What could we do to improve the program? What topics would you like to see in the program?			
	Gender		
	Female	Male	Response Count
	10 replies	8 replies	18
<i>answered question</i>	10	8	18
<i>skipped question</i>			2

11. How important was it to get one unit of CCSF college credit?			
	Gender		
	Female	Male	Response Totals
Absolutely necessary (I wouldn't have taken the course otherwise)	0.0% (0)	0.0% (0)	0.0% (0)
Very important	9.1% (1)	11.1% (1)	10.0% (2)
Nice, but not that important	90.9% (10)	55.6% (5)	75.0% (15)
I got credit?!	0.0% (0)	33.3% (3)	15.0% (3)
<i>answered question</i>	11	9	20
<i>skipped question</i>			0

12. Are you planning on attending CCSF classes in the future?			
	Gender		
	Female	Male	Response Totals
Yes	27.3% (3)	0.0% (0)	15.0% (3)
No	0.0% (0)	0.0% (0)	0.0% (0)
Maybe	72.7% (8)	100.0% (9)	85.0% (17)
<i>answered question</i>	11	9	20
<i>skipped question</i>			0

13. Did the iDesign program change your opinion about attending CCSF classes?			
	Gender		
	Female	Male	Response Totals
Yes, I'm now MORE interested in taking classes at CCSF.	81.8% (9)	22.2% (2)	55.0% (11)
Yes, I'm now LESS interested in taking classes at CCSF.	0.0% (0)	0.0% (0)	0.0% (0)
No, it did not change my opinion of taking classes at CCSF.	18.2% (2)	77.8% (7)	45.0% (9)
COMMENTS	2 replies	2 replies	4
<i>answered question</i>	11	9	20
<i>skipped question</i>			0

APPENDIX – FINAL PRESENTATION WITH PHOTOS

iDesign

Summer Engineering Program at City College of San Francisco

iDesign is a free, 2-week engineering program for high school students interested in technology. It's a hands-on course where students design, build, play, travel, take apart, and learn – all while having fun and learning how engineers help society.



EARTH FRIENDLY



Instructors

- Mike Kimball
- Mark Martin
- Ani Niow (Course Assistant)

Please contact Mark Martin for any questions (mvmartin@ccsf.edu)

Aug 11, 2009

iDesign Overview

- The goal of the iDesign program is to excite and inspire students to pursue careers in engineering. We are also encouraging students to consider City College of San Francisco as an option for engineering classes during, or after, high school.
- This was the first year for the program. We had over 65 applications for the program, and we enrolled 22 students – with twelve being girls (55%). All the students were going into their junior or senior years in local San Francisco high schools (Burton, Galileo, Gateway, Lowell, or Washington).
- The students met for 10 days (July 13 – 24) from 8:30 – 4:30 pm Monday through Friday. The course was a mix of projects (wind turbine, and electronic “Blinky” circuit), lectures, field trips, and guest speakers.

AGENDA

- Thanks
- Overview of iDesign
- Activities
- Wind Turbine Project
- Student Feedback



S. D. BECHTEL, JR. FOUNDATION
STEPHEN BECHTEL FUND



Thanks to our SPONSORS

- CCSF
- Bechtel Foundation
- CACT (Center for Advanced Competitive Technology)
- Logitech
- Stanford Clayman Institute
- General Foundry



S. D. BECHTEL, JR. FOUNDATION
STEPHEN BECHTEL FUND

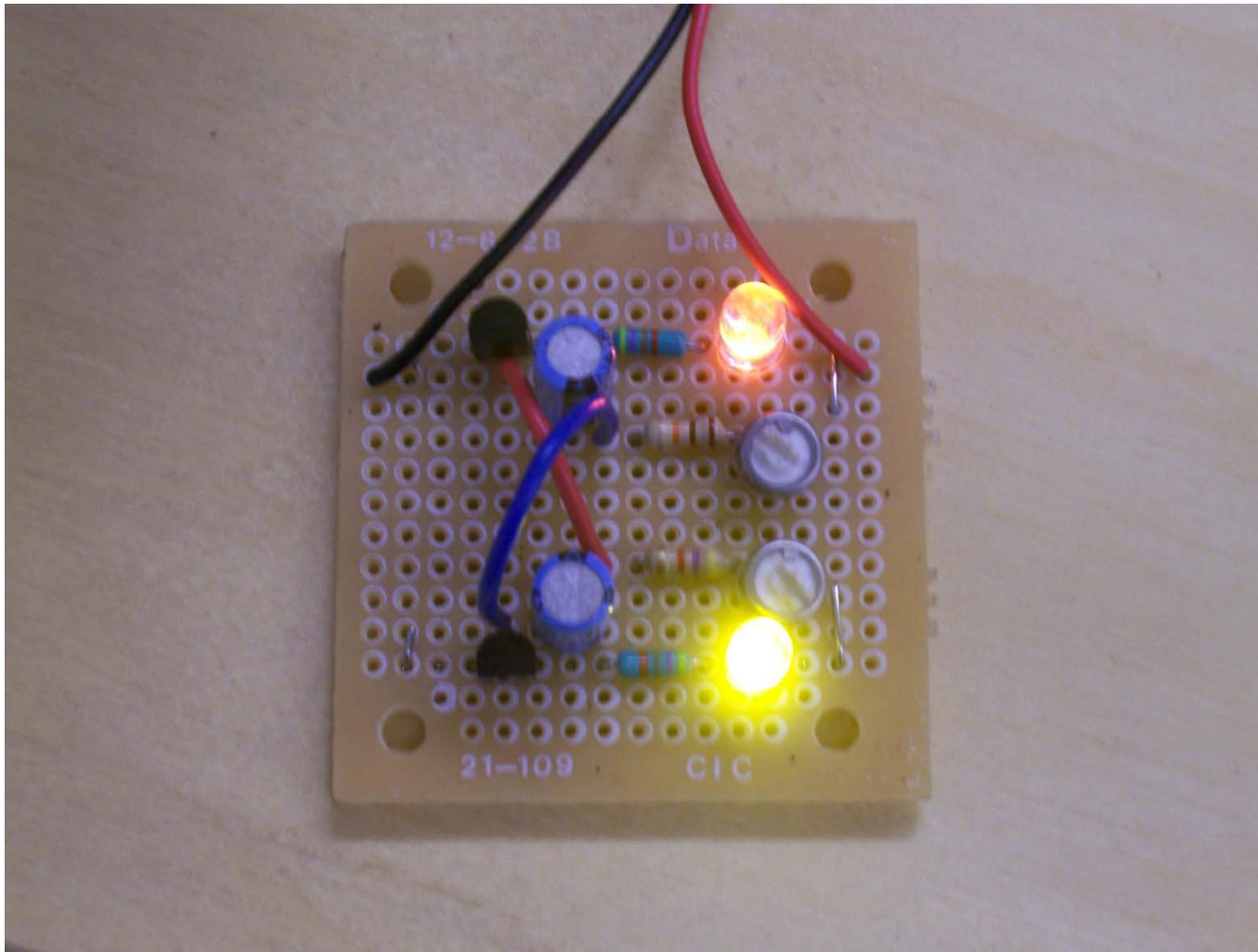


GENERAL RESEARCH

ICEBREAKER (or Spaghetti Breakers)



BLINKIES



SPEAKERS

- Logitech
 - Webcams, mice, game controllers, etc.
- Wild Planet
 - Toys
- Forell
 - Structural Engineering
- Tesla Motors
- Stanford grad student

FIELD TRIPS

- Berkeley Bionics
- UC-Berkeley CITRIS
- General Foundry
- Makani Power
- Construction site

BERKELEY BIONICS



UC-BERKELEY



GENERAL FOUNDRY



MAKANI POWER



TESLA MOTORS



FORELL CONSTRUCTION SITE



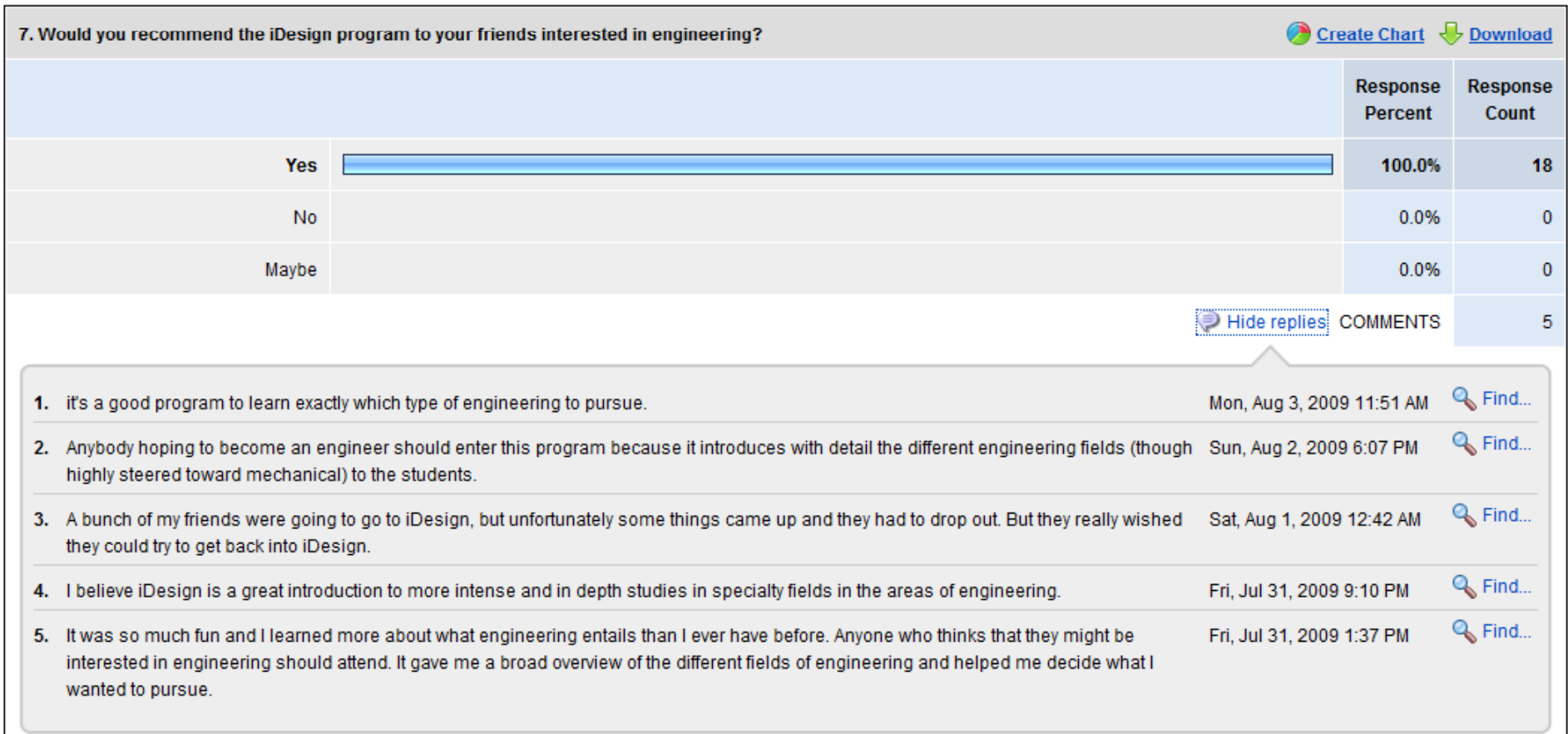
WIND TURBINE PROJECT

- TEAM PRESENTATIONS
 - Flaming Squirrels
 - Cherries
 - FlyBats
 - Wind Hackers
 - Flying Unicorns

Student Feedback





- Would you recommend iDesign to your friends?
- Did iDesign help you in your decision to pursue engineering as a career?

Student Feedback *



* Anonymous survey

Student Feedback *

6. Did iDesign help you in your decision to pursue engineering as a career?				 Create Chart	 Download
	Gender				
	Female	Male			Response Totals
It STRENGTHENED my interest in becoming an engineer	90.0% (9)	62.5% (5)			77.8% (14)
It LESSENERED my interest in becoming an engineer	0.0% (0)	0.0% (0)			0.0% (0)
It did not change my interest level	10.0% (1)	37.5% (3)			22.2% (4)
What type of engineering are you interested in pursuing? Why?	 6 replies	 6 replies			12
answered question	10	8			18
				skipped question	0

* Anonymous survey