City College of San Francisco / Laney College
iDesign Summer Programs (2012)
Final Grant Report
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http://www.californiatechedresources.org/idesign/
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<u>**PROJECT**</u>

Brief summary of project and its goals

iDesign is a free 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 technology helps society. It is administered through City College of San Francisco (CCSF).

There are 2 different programs under iDesign:

- iDesign-E – a 2-week program for students interested in learning and experiencing engineering. It was held from June 4 – June 14, 2012 at CCSF Ocean Campus.

- iDesign-M – a 2-week program for students interested in learning and experiencing manufacturing technology. It was held from June 18-29, 2012 at Laney College in Oakland.

The goal of these programs is to excite and inspire students in careers in technology. We are also encouraging students to consider community colleges as an option for college classes during, or after, high school.

This was the fourth year for the iDesign-E program, and the third year for iDesign-M. We had 42 students participate in the programs (24 in iDesign-E, 18 in iDesign-M), with students from San Francisco, Oakland, San Leandro, and Pleasanton.

iDesign-E
Overview
The iDesign-E students met for 10 days from 9:00 – 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.

The twenty-four students (10 female, 14 male) were drawn from an applicant pool of 69 and came from the following San Francisco schools:

- Burton (1)
- Galileo (8)
- International Studies Academy (1)
- Lowell (8)
- Metropolitan Arts and Tech (1)
- Wallenberg (3)
- Washington (2)

Teaching the course we had two engineering faculty from CCSF (Mike Kimball & Hitesh Soneji) and two course assistants (Hugo Tupac & Carolina Miranda). In addition, Mark Martin helped teach and handle logistics.

We had speakers from a solar power company, and from Forell / Elsesser Structural Engineers; and went on field trips to Google Headquarters in Mountain View, Stanford University's Design EXPE for Senior Engineering Projects, the Tech Museum, and Makani Wind Power in Alameda: an innovative wind power company. The Makani visit was especially fruitful as the students were exposed to the same challenges in wind turbine design found in both industry and their own iDesign projects.
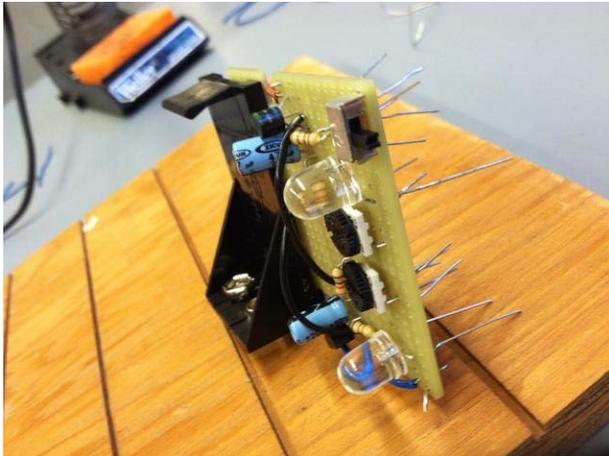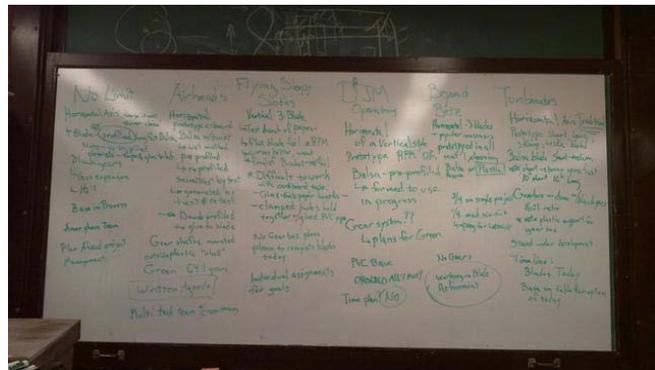

Finished Blinky Project
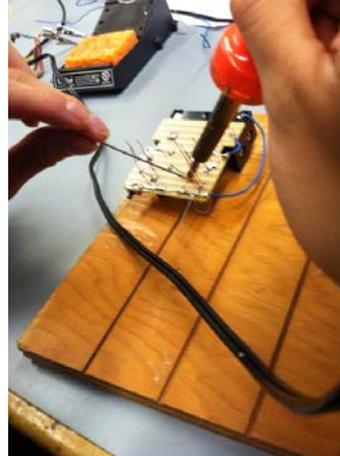
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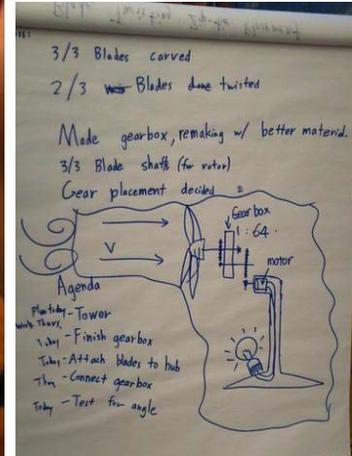
Wind Turbine Brainstorm

Wind turbine blade development

Project team status updates

Wind turbine testing and power measurements

Wind turbine final presentation and demo

A detailed schedule follows.

iDesign-E Program 2012

	4-Jun Mon	5-Jun Tues	6-Jun Wed	7-Jun Thurs	8-Jun Fri	11-Jun Mon	12-Jun Tues	13-Jun Wed	14-Jun Thurs	15-Jun Fri
9:00 – 9:30	Intro (S-100)	LAB: - Blinky project	LAB: - Blinky project	Leave 9:05!	PROJECT	PROJECT	PROJECT	TRAVEL	PROJECT	PROJECT
9:30 – 10:00	Team-building exercises	LAB: - Blinky project	ACTIVITY: - Break out into teams - Team names	Travel	PROJECT	PROJECT	PROJECT	Makani Wind Power: Kite Based Power Production	PROJECT	PROJECT
10:00-10:30	Team-building exercises	LAB: - Blinky project	LECTURE: - Wind Project (HS)	Google (MV)	PROJECT	PROJECT	PROJECT	Makani Wind Power: Kite Based Power Production	PROJECT	PROJECT
10:30 – 11:00	Team-building exercises	LAB: - Blinky project	ACTIVITY: - Brainstorm what you think the	Google (MV)	PROJECT	PROJECT	PROJECT	Makani Wind Power: Kite Based Power Production	PROJECT	PROJECT
11 – 11:30		LAB: - Blinky project	LECTURE: - Wind Project (HS)	Google (MV)	DEMO: Materials for project. Tools for project (30 minutes)	PROJECT	PROJECT	Makani Wind Power: Kite Based Power Production	PROJECT	PROJECT
11:30 – 12	CCSF Orientation / CCSF Tour	LAB: - Blinky project	LECTURE: - Materials (MK) Wind Video (hr)	Travel	PROJECT: Decision (vertical or horizontal)	PROJECT	PROJECT	TRAVEL	PROJECT	LECTURE (MM/ HS): Types of Engineering
12 – 12:45	Lunch	Lunch	Lunch	Tech Museum (Lunch)	Lunch	Lunch	Lunch	Lunch	Lunch	Lunch
12:45 – 1:30	LECTURE (HS): Electronics (12:45 - 1:45)	LAB: - Blinky project	- Online research & start of brainstorming of blade designs	Tech Museum (Lunch)	PROJECT	PROJECT	PROJECT	TESTING: Power generation from each team	PROJECT	Lab clean-up Prepare for presentations
1:30 – 2	LECTURE (MK/HS): Soldering - (1:45 - 2:15)	LAB: - Blinky project	ACTIVITY: - Create schedule	Standford's Showcase of Senior	SPEAKER: - Vivek Phanse	PROJECT	PROJECT	TESTING: Power generation from each team	PROJECT	Lab clean-up Prepare for presentations
2 – 2:30	LECTURE: - Soldering (MK)	LAB: - Blinky project	ACTIVITY: - Online research & start of brainstorming	Engineering Design Projects	SPEAKER: - Vivek Phanse	PROJECT	PROJECT	TESTING: Power generation from each team	PROJECT	Lab clean-up Prepare for presentations
2:30 – 3	LAB: - Blinky project	LAB: - Blinky project	LECTURE: Airfoils (MK)	Standford's Showcase of Senior	PROJECT	PROJECT	PROJECT	TESTING: Power generation from each team	PROJECT	Lab clean-up Prepare for presentations
3 – 3:30	LAB: - Blinky project	LAB: - Blinky project	PROJECT	Engineering Design Projects	PROJECT	SPEAKER: - Structural Engr (Marco Scanu)	TESTING: Power generation from each team	PROJECT	PROJECT	Project presentations
3:30 – 4	LAB: - Blinky project	LECTURE: How does a Blinky work (HS)	DEMO: - How to build blades	Travel	PROJECT	SPEAKER: - Structural Engr	TESTING: Power generation from each team	PROJECT	PROJECT	Project presentations
4 – 4:30	LAB: - Blinky project	ACTIVITY: - Blinky project ancillar cape probing	Field trip (FT) prep	CCSF	PROJECT	SPEAKER: - Structural Engr	- TESTING - Field trip (FT) prep	PROJECT	PROJECT	Project presentations ___ RECEPTION

iDesign-E 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 (20 of 24 responded), 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-E and found it educational. In addition, we conducted a formal, anonymous survey following the program. Some of the main points:

- *100% agreed (or strongly agreed) that iDesign-E was educational (100% in 2011).*
- *100% agreed (or strongly agreed) that iDesign-E was fun (96% in 2010).*
- *70% said it strengthened their interest in pursuing engineering as a career (83% in 2010).*
- *100% of the students would recommend the program to a friend (91% in 2011)*
- *33% said that the iDesign program made them more interested in attending CCSF classes (61% in 2011, 27% in 2010)*

 Some comments from the students:

"I liked that we were able to explore options of our own when building the wind turbines. There wasn't a lot of specific instructions but that helped to give us the opportunity to succeed and/or learn from our mistakes."

"I may not be more interested in taking classes at CCSF but if I do attend CCSF, I know there are some good professors there"

"Encouraged self motivation as real life would present it."

"The field trips were all fun and educational. Google especially was quite an interesting experience."

"Great topics and equally great presentations and presenters."

"I had hardly knew anything about engineering when I first came into iDesign. But, after the whole program, I see the world differently and engineering is a bit more interesting than before."

"I liked the exposure to different types of engineering as well as hearing from and learning from actual engineers in their respective fields."

"I really liked working in the group on making a wind turbine that actually WORKED! Also, making the blinkie myself and learning how to work some of the tools proved to be very satisfying."

iDesign-M
Schedule

The students met for 10 days from 9:00 – 4:45 pm for ten days. The course was a mix of projects, lectures, and field trips. We wanted the students to hear from those working in the manufacturing industry, and also see up close where and how they work. We had field trips to General Foundry (casting) and Allied Engineering (machining of large scale projects, such as valves for Hetch Hetchy pipes).

The main project was the design and creation of a 1/24th scale model car. Using various manufacturing technologies (milling, turning, grinding, polishing, drilling, CNC, anodization, etc.), the students each made their own car.

The 18 students (12 male, 6 female - in 2011 it was 14 male, 1 female) who completed the program were drawn from 28 applications. For safety reasons, and to make sure the students all had enough access to machines and teacher assistance we have a maximum capacity of 18. The students came from the following Oakland and surrounding schools.

- Alameda High School (2)
- Arise high school (2)
- Bayhill High School (1)
- Castlemont (1)
- Chinese Christian Schools (1)
- Fremont Federation High School (1)
- Gaetway to College (1)
- Metwest (3)
- Oakland Technical High School (4)
- Quarry Lane School
- San Leandro High School

The lead teacher for the course was Peter Brown, who is on the faculty in the Laney College machining department. In addition, we had four course assistants (Micah Chong, Patrick Lyons, Roger Sunday, and Beckey Kaye). Mark Martin helped with logistics.
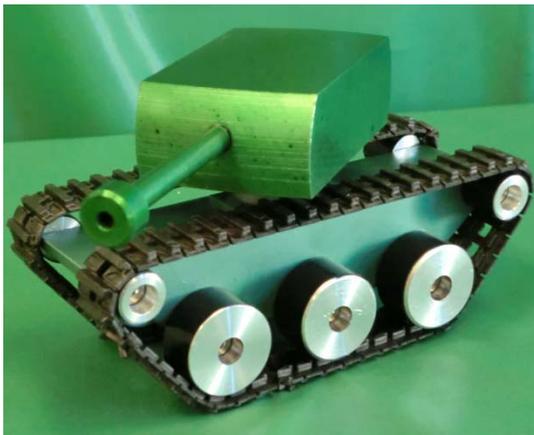
Students were enrolled in, and received credit for, a Laney College special projects class (1.5 units).

First day ice-breaker (egg drop)

Machining

A few of the finished "cars"

A detailed schedule follows.

iDesign-M Program 2012

	18-Jun Mon	19-Jun Tues	20-Jun Wed	21-Jun Thurs	22-Jun Fri	25-Jun Mon	26-Jun Tues	27-Jun Wed	28-Jun Thurs	29-Jun Fri
9:00 - 10:30	Team-building exercises	MACHINING	MACHINING	MACHINING	9:00 am Bus ⎯⎯ 9:30 am - 11:00 am General Foundry	Machining Project	Machining Project	Machining Project	Machining Project	Machining Project
10:30 - 12	Campus Orientation / Tour	MACHINING	MACHINING	MACHINING	General Foundry Lunch	Machining Project	Machining Project	Machining Project	Machining Project	Machining Project
12 - 1:00	Lunch	Lunch	Lunch	Lunch		Lunch	Lunch	Lunch	Lunch	Lunch
1:00 - 2:30	DEMO & SAFETY LECTURE: Machining	MACHINING	MACHINING	MACHINING	Allied Engineering Plant Tour	Machining Project	Machining Project	Machining Project	Machining Project	RECEPTION / Presentations
2:30 - 4:45	DEMO & SAFETY LECTURE: Machining	MACHINING	MACHINING	MACHINING	Allied Engineering Plant Tour	Machining Project	Machining Project	Machining Project	Machining Project	RECEPTION / Presentations

iDesign-M Assessment and analysis of whether intended outcome was realized
Our goal in the program was to introduce the students to manufacturing, and give them insights into different career paths, as well as get them acquainted with Laney College.

During the program, and at the final presentations (where many students brought family or friends), we heard the students proudly discuss the work they had done. We also conducted an anonymous, online survey and had 10 of 18 students respond.

- *100% agreed (or strongly agreed) that iDesign-M was educational (100% in 2011)*
- *100% agreed (or strongly agreed) that iDesign-M was fun. (100% in 2011)*
- *90% of the students would recommend the program to a friend, with one person answering "maybe" (60% in 2011)*
- *40% said that the iDesign program made them more interested in attending Laney classes (50% in 2011)*

Some comments from the students:

"I was familiarized with using tools that I had never before touched, like the mill and lathe. It gave me an idea that ordinary day to day objects take time and precision to make, despite how simple they may seem."

"I think you guys did great in helping everyone and I really like the car project."

"A) I was very proud of my car, and surprised I could accomplish so much in one week. B) Although we had several instructors, we still did not have enough for everyone to work simultaneously."

"The car project came out successfully. Working with different personalities taught me how to be open minded to people, while not judging a book of its cover."

Q: What did you like MOST about the iDesign-M program?

"I had total control over the creative process in making my car."

"Using the machines and creating whatever you designed."

"I liked designing my own car and working on the machines after I got the hang of it.

OVERALL iDesign Program

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

iDesign-E

In the past our biggest challenge was getting student applications from a wide variety of schools. This year we had a nice representation from across a range of San Francisco high schools. Because of the large number of applications (total of 69), we gave priority to applicants from the rising senior class, since this was their last opportunity to attend. Because of the strong applications we had in this group, all of our attendees ended up being rising seniors. For next year, we will give first priority to rising juniors who applied this year but were not admitted.

iDesign-M

In the past, our biggest challenge has been in recruiting and getting enough motivated applicants. This year we had a strong applicant pool of 28. We admitted 18 students, and actually had a couple of extra people from the waitlist show up hoping to get in case someone dropped. No one did, however, so unfortunately we had to turn these 2 students away (because of safety and machine capacity, we can only handle a maximum of 18 students for the summer class). While we are happy with the number of applicants we had, and the quality of the students, we still want to continue to improve our outreach efforts so that we make sure that as many students in Oakland and the surrounding area learn about our program and Laney College.

BUDGET

Below is a table showing the original budget figures, actual expenses, and variances.

iDesign-E 2012 Summer Program
Final Budget

		Budgeted (4/6/12)	Actual Costs	Variance	Reason for Variance
TEACHING	Faculty & course assistants	$ 20,978	$ 21,657	$ (679)	Increase in benefit and salary rates from 2011.
TRANSPORTATION	Bus Transportation	$ 1,400	$ 1,100	$ 300	
SUPPLIES	Materials & tools	$ 800	$ 1,550	$ (750)	Original material budget (for Kidwind turbines, Blinky supplies, wind turbines) were estimates.
	Tuition	$ -	$ 748	$ (748)	We had one student that did not live in California long enough to have residency, so we needed to pay out-of-state tuition for that student.
MISCELLANEOUS	Receptions / food	$ 600	$ 195	$ 405	We intended to have a pre-program pizza party for students and family, but did not schedule one this year. Costs for final reception were also lower than expected.
	EXPENSES TOTAL	**$ 23,778**	**$ 25,250**	**$ (1,472)**	
ADMINISTRATIVE	CCSF Admin Charge (8.0%)	$ 2,400	$ 2,020	$ 380	
	CCSF Foundation Fee (5.0%)	$ 1,500	$ 1,500	$ -	
	GRAND TOTAL	**$ 27,678**	**$ 28,770**	**$ (1,092)**	

iDesign-M 2012 Summer Program

Final Budget
30-Jun-12

		Budgeted (4/1/11)	Costs	Variance	Reason for Major Variance
TEACHING	Faculty & course assistants	$ 21,120	$ 22,000	$ (880)	# of hours changed some in order to handle student needs
TRANSPORTATION	Bus Transportation	$ 1,000	$ 750	$ 250	
SUPPLIES	Materials & tools	$ 2,000	$ 2,263	$ (263)	
MISCELLANEOUS	Receptions / food	$ 600	$ 200	$ 400	
	EXPENSES TOTAL	**$ 24,720**	**$ 25,213**	**$ (493)**	

ADMINISTRATIVE	CCSF Admin Charge (8.0%)	$ -	$ -	$ -	
	Peralta Foundation Fee (5.0%)	$ 750	$ 575	$ 175	
	GRAND TOTAL	**$ 25,470**	**$ 25,788**	**$ (318)**	

Total 2012 Costs	**$54,558**
iDesign-E	$28,770
iDesign-M	$25,788
Funding	**$55,000**
Bechtel Foundation	$25,000 (used for both iDesign programs)
Lee Chj Family Charitable Fund	$15,000 (used for iDesign-E)
Chevron Foundation	$11,500 (used for iDesign-M)
Existing CCSF grants	$1,500
Existing Laney grants	$2,000

CONCLUSION

Summary

As in previous years, we had a great group of students this year. We are especially excited about the outreach efforts for both programs. The word has spread about these programs and we are getting students from previous classes referring younger students.

The survey results from the iDesign-E program continue to confirm that for those students interested in engineering, we were successful in getting them more excited about engineering. The students had a chance to talk to engineers in industry, while touring a number of different facilities.

And for the iDesign-M program, it continues to grow in reputation and is a great introduction for students to Laney and to the machining program. We will continue to use the iDesign-M program in our efforts to bring manufacturing programs and activities to Oakland schools.