



CACT CTE HUB Director Annual Report 2009 – 2010 grant (09-173-007)

Dates of grant activity: Apr 2010 – Jun 2011

Written: August 26, 2011

INTRODUCTION

This is the yearend report for the CACT CTE Hub Director grant for 2009-2010. The goal of this grant is to encourage more students to enter careers in manufacturing and advanced technology in the state of California. Below are the main activities during this period.

Note that the 2009-2010 grant would typically run from July 2009 – June 2010. However, due to the hub grants being awarded on a delayed schedule, the work for 2009 – 2010 was performed from April 2010 – June 2011 (Q4 – Q8).

If you have any questions, please feel free to contact me.

Regards,
Mark

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Ever wonder how something is made? If so, check out:

<http://manufacturing.stanford.edu>

&

<http://twitter.com/mvmartin>



CACT CTE HUB GRANT ACTIVITIES

The main goal of the CTE Hub Grant is to get more students in California interested in, and entering, careers in manufacturing and technology. The activities to achieve this goal are focused on the following:

- **Inform and excite K-14 students** about careers available in manufacturing and technology
- Support K-14 manufacturing / technology educators to help **strengthen manufacturing programs**
- **Strengthen industry connections** with K-14 manufacturing / technology programs
- Improve networking between K-14 teachers, administrators, and manufacturing / technology organizations (Society of Manufacturing Engineers, Silicon Valley Engineers Council, CITEA, etc.) in order to strengthen manufacturing programs in the state
- Educate students, teachers, administrators, and the general public about the importance to the state of California of manufacturing and technology education

In the pages below I describe in detail the activities for the 2009-2010 grant.

K-14 OUTREACH

1. **Laney College fundraising** – was successful in finding \$10,000 in funding for Laney College’s dual enrollment machining class for at-risk high school students. This class was first held in 2010 and they are now working to continue on with the program in 2011. The Soda Foundation (\$5000) and Thomson Foundation (\$5000) were the contributors.
2. **iDesign Summer Programs**
iDesign-E
 - a) iDesign-E is a free, 2-week program focused on getting high school students interested in engineering. 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. This program was held at the CCSF Ocean Campus in June 2011. Twenty-four high school students (18 female, 6 male) participated in classes, field trips, and hands-on projects to learn about engineering. All twenty-four students completed the program. Instructors were Mike Kimball, Hitesh Soneji, and Mark Martin.
 - b) During the course they built electronic “Blinkies”, worked in teams to design and build a working wind turbine, listened to guest speakers from industry, and traveled to local engineering and manufacturing companies.
 - c) iDesign fundraising
 - i- I was able to raise \$41,000 total – with the funds coming from the Bechtel Foundation (\$30,000), Laney College Tech Prep funds (\$6000), and Logitech (\$5000).
 - d) Recruited students to the program. Activities included talking to and meeting with high school students, teachers and administrators at Marshall, Washington, Galileo, Burton, and Lowell high schools. We had 68 students apply to the program.
 - e) Organized administrative logistics for the program. Activities involved all the necessary items needed to get students admitted to City College (applications, transcripts, consent forms, recommendation forms, orientation, counseling, etc.), as well as other activities (hiring of teacher and course assistant, ordering of materials and supplies, finding classroom space, etc.).
 - f) I also worked to organize speakers and field trips for the students. Worked with a number of companies (United Airlines, General Foundry, Forell, Logitech, Lunar Design, and Wild Planet).

- g) Developed report for funders and contributors to the program. The report can be found at: <http://www.californiatechedresources.org/idesign/>
- h) Some results from an anonymous survey of the students:
- i- 100% agreed (or strongly agreed) that iDesign-E was educational (96% in 2010).
 - ii- 96% agreed (or strongly agreed) that iDesign-E was fun (96% in 2010).
 - iii- 83% said it strengthened their interest in pursuing engineering as a career (92% in 2010).
 - iv- 91% of the students would recommend the program to a friend (with the remaining two people answering “maybe”) (91% in 2010)
 - v- 61% said that the iDesign program made them more interested in attending CCSF classes (27% in 2010)

Some comments from the students:

“The hands-on learning was amazing because the sense of accomplishment I felt after learning about something through building it with my own hands is a feeling that I would never be able to find within the textbook --> homework --> study --> test that I so often experience in the high school classroom. I loved that this program was able to combine both the fun and the educational through giving us a huge amount of knowledge, and then giving us a chance to apply that knowledge.”

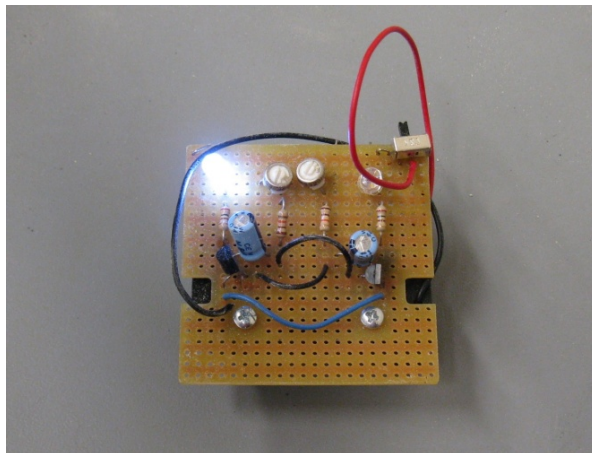
“It was fun WHILE educational! - Rare.”

“too many girls! ... program was too short!” (from a female student)

“iDesign was the one of the best experiences I've had, I would certainly recommend this program to anyone who has an interest in engineering or just exploring interests. During the program, I was able to have many hands-on experiences, some of which I would never see happen even at school.”



Wind turbine project



Blinky project

iDesign-M

- i) iDesign-M is a free, 2-week program for high school students interested in manufacturing technology and creating things. This is a hands-on course where students design and build items in the machine shop – all while having fun and learning about manufacturing.

iDesign-M is based at Laney College in Oakland and was held in June 2011. Lead instructor was Peter Brown with additional support from department chair Louis Quindlen. We had 23 students participate (from 30 applications), with fifteen of them completing the full 2 weeks of the program. The students completing the program came from Oakland and other local schools: FarWest, Livermore, MetWest, Oakland School of the Arts, Oakland Tech, Rudsdale, San Leandro, and Zapata Street Academy.

The students designed and built 1/24th scale cars using machining technology. They learned

- how to safely operate mills, lathes, grinding and polishing tools, and bandsaws. They were also introduced to computer aided design (CAD) software (Solidworks) and computer numerical control (CNC) software (MasterCam). In addition to the project, they visited local manufacturing companies in the Bay Area.
- j) Major funding for the program came from the Bechtel Foundation, with additional funds from the Laney College Tech Prep funds, Logitech, the CACT CTE Hub, and the ATTE initiative.
 - k) Some results from an anonymous survey of the students:
 - i- 100% agreed (or strongly agreed) that iDesign-M was educational (100% in 2010)
 - ii- 100% agreed (or strongly agreed) that iDesign-M was fun. (83% in 2010)
 - iii- 60% of the students would recommend the program to a friend, with two people answering “maybe” (60% in 2010)
 - iv- 50% said that the iDesign program made them more interested in attending Laney classes (33% in 2010)

Some comments from the students:

“I enjoyed every minute of the car project. I was able to build the car I truly wanted to build. It was an amazing experience.”

“I learned how to plan out my car before i built it, and making sure that the measurements on my sketch were accurate to the actual thing.”

“It let me give myself more options on what careers I want to take in the future.”

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

“The fact that I was able to use my imagination and I was able to build what I could dream up.”

“Being able to see a project through to completion.”

“Learning.”



Machining



Rapid prototyping



Scale-model cars (before anodization colorization)



Chillin' at the Allied Engineering field trip

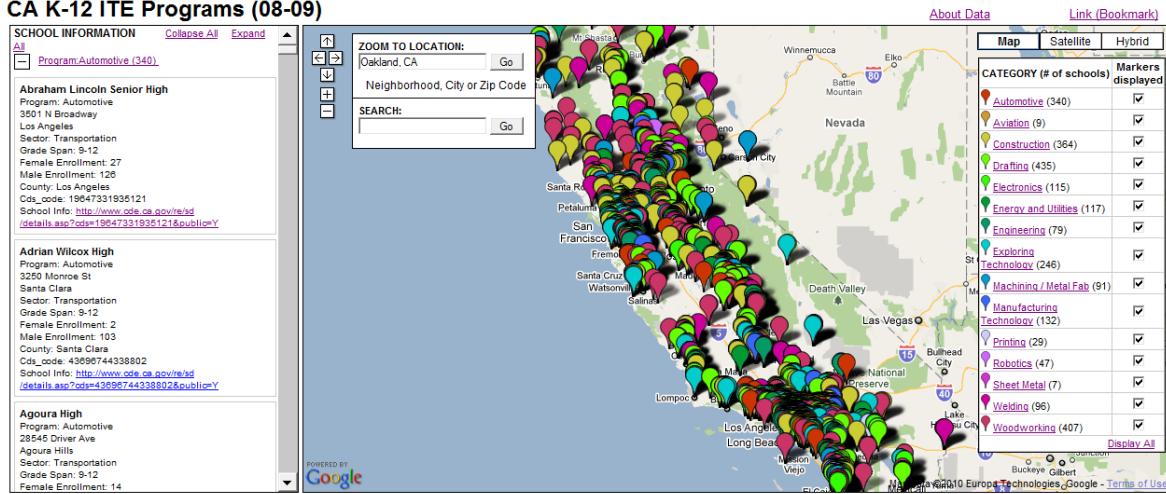
3. Participated in **career outreach** to students

- Presented to a 6th grade classroom as part of the Volunteer Match program (“What do engineers do?”)
- Visited or spoke to students and counselors about the iDesign engineering and manufacturing programs at:
 - San Francisco (Burton, Thurgood Marshall, Galileo, Lowell, & Washington)
 - Oakland (FarWest, MetWest, Oakland Tech)

STRENGTHENING MANUFACTURING PROGRAMS

1. Work as an advisor for CDE's update of the **CA Manufacturing & Engineering CTE Standards**. Met in advisory meetings on May 18-19 and June 14, and continue to work on reviewing and updating standards.
2. Invited speaker in an **SME Web Forum** (broadcast nationally on May 27) on Manufacturing Education in the United States.
3. **Industrial Maintenance Mechanic / Machinist (IMMM)** – held our IMMM workshops (March 29 & June 10) at Chabot College. We had community colleges and industry reps (over 20) in attendance to discuss how to establish programs at the CC's in Industrial Maintenance. We established the need for more IMMM's in the Bay Area and have a follow-up meeting with more industry reps in September.
4. Met with a **Bay Area Manufacturing Renaissance Council** sub-group to find an East Bay high school for a potential Manufacturing Career Academy. Currently we are talking with McClymonds High School in Oakland. We have met with principals and teachers, and will meet with parents next month to assess their interest in this type of academy.
5. **CCCAOE Conference** (Oakland) – presented overview of the iDesign program at CCCAOE conference. Talk gave information on the logistics of starting such a program at other locations in the state. Received five requests for the detailed "iDesign-in-a-Box" instructions on how to setup such a program.
6. Met as a member of the **Bay Area Manufacturing and Precision Machining Consortium** (based out of Petaluma HS). The purpose of the consortium is to develop and implement a high-quality, industry-validated CTE program of study in machine tool technology. Meetings are held monthly to work out strategy for implementation of programs in Northern California and throughout the state. Developed strategies to implement NIMS certification in high schools and community colleges in the state.
7. **CITEA** - Continued to work with the California Industrial & Technology Education Association (CITEA) teacher's group to strengthen Industrial Tech programs throughout the state.
 - Mapping of ITE programs in state is being used by CITEA to help in outreach efforts to teachers.
 - Attended CITEA annual conference in Fresno, CA (March 2011).
 - Setup a booth to promote the CTER website to CTE teachers throughout the state, including lunch presentation.
 - Met with teachers and with CITEA leadership to gather information about how CTE Hub position can help increase interest in career pathways in manufacturing and technology.
 - Met with CITEA governing board to help in strengthening their organization and work to assist teachers throughout the state.
 - Participated in CITEA Petaluma Industrial Tech teacher's conference (Sept 2010).
8. **GIS Mapping Program** - Began work on updates on the GIS program for mapping high school & community college technology programs. This is a site where teachers, administrators, industry personnel and others can come to search for industrial technology programs in the state. The goal is to create a stronger awareness of programs and increase networking between the various constituencies. <http://www.californiatechedresources.org/maps/hs/map.php> (note: this is viewed best using Firefox or Safari browsers).

CA K-12 ITE Programs (08-09)



INDUSTRY OUTREACH

- 1) **Volunteer Match** - Continued to develop the Volunteer Match (VM) software which was created by the CTE Hub and is being used by the Silicon Valley Engineers Council (SVEC) to match teachers with engineers. These engineers went into the classrooms to talk to students about technology during the spring of 2011. This is the second year using the software. We also updated the software based on user feedback.
 - a) The link to the software is posted at <http://www.svec.org/DiscoverE/teachltr.html> (click on "Discover E Classroom Request")
 - b) We have over 450 teachers and 470 volunteers signed up for the program, representing numerous schools in the Bay Area and dozens of companies. We had 270 teacher assistance requests this year, representing over 7400 students.
 - c) **Educating for Careers conference (Sacramento)** — gave a talk at the Educating for Careers conference in Sacramento on the VM software and made it available to others. Received a number of requests for the software and will work to implement it in other programs in the state.
 - d) We have begun to distribute the software statewide to other organizations. The Engineers Council in the Los Angeles area is working to implement the software, as well as the Sonoma County school district. We are also looking at modifying the software to use to match students with company internships in manufacturing.

Browsing of Teacher Assistance Requests

Welcome Mark Martin

Thanks for offering to visit a classroom to discuss engineering with the students and teacher. Below is a list of requests from teachers for engineers. Please look through the list and email teachers whose classrooms you would like to visit (click on their name to send an email).

We ask that you contact only one or two teachers at a time. It may take a few days for a teacher to get back to you.

To reduce the size of the list, you may search by zip code, school name, teacher first name, teacher last name, or other keywords.

**Note: If a Request Status is shown as "In-Progress" or "Scheduled", that means that teacher request has already been contacted by another volunteer and is not available.*

| County | School | City | Teacher | Request Status * | Subject | Category | Details | TimeFrame | # of students in class |
|-------------|--|------------|---------------------------------|------------------|---------|-------------------------|---|---|------------------------|
| Santa Clara | San Martin Swinn School 100 North Ave San Martin 95046-9517 | San Martin | Amy Campbell | In-Progress | all | E-Week - One hour visit | Grade 3: We have 3 1/2 3rd grade classes and we would like a presentation for each class. We can divide the 1/2 amongst the 3. If we do that, we will have 3 classes of 24. | Jan/Feb /Mar/Apr/May M-W any time after 9:15 | 20 |
| Santa Clara | Bachrodt Academy 102 Sonora Ave San Jose 95110 | San Jose | Hanna Melnick | In-Progress | All | E-Week - One hour visit | Grade 4: I would like to tie E-Week in with science and have the students learn about "cool" things engineers do as well as how to become an engineer. | Jan Mon, Wed. 12:55-1:45 or Mon, Wed, Thurs, Fri. 1:45-2:45 | 22 |
| Santa Clara | Curtner Elementary 275 Redwood Ave Milpitas 95035 | Milpitas | Carrie Mitchell | Open | All | E-Week - One hour visit | Grade 3: 9:45 is also an option. I am pretty flexible on Wednesdays. | Jan/Mar Wednesdays, 11:10 or 1:10 | 30 |

- 2) **Career Counseling Workshop in manufacturing** – held workshop at General Foundry (in San Leandro) on May 12. There were 38 counselors in attendance from WIB’s, community colleges, high schools, and other workforce employment centers. We had speakers from Tesla, General Foundry, Shell, 101MFG, and Life Technologies and offered information to the counselors about careers and community college programs.
- 3) **Industrial Maintenance Mechanic / Machinist (IMMM)** – Developed online survey for determining the job openings and skill-sets for Industrial Maintenance Mechanics (<https://www.surveymonkey.com/sr.aspx?sm=CmSRAoOkClOazdfSeNYWrndShAs5winPZsXwQU20xE 3d>). Used this information during our IMMM meeting (June 10) at Chabot College where we met with local manufacturing companies to further develop our plans for creating local programs to meet industry needs for maintenance mechanics.
- 4) **California Tech Ed Resources website** (<http://www.californiatechedresources.org/>).
 - a) This is a resource for teachers and administrators throughout California to give them information relevant to manufacturing and engineering career pathways.
 - v- Maps of high school and community college technical programs throughout the state
 - vi- List of activities and competitions that K-12 students can become involved in
 - vii- Equipment Swap site for industrial tech teachers
 - viii- And other features
 - b) Continue to update the site with new material.



California Technology Education Resources

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CTER Goal

The goal of the California Technology Education Resource (CTER) Center is to provide a resource for teachers and administrators in technology education in the state of California. We define this to include those in industrial technology education (such as machining, welding, drafting, automotive, construction, etc.), engineering, and other technology-related classes. While it is targeted more towards K-12 teachers, there will also be information useful to Community College and university teachers as well.

By providing these resources for teachers, we hope to assist them in getting more kids interested in careers in manufacturing, engineering, and technology-related careers.

Resources

This Resource Center is focused on helping high school, middle school, and community college teachers in a number of different ways. Note that not all of these resources are available at this time. The site is being launched in December 2009, and new features will be added over the coming months.

- Connect with other teachers & programs
- Connect with industry
- Find classroom materials
 - Curriculum
 - Examples of hands-on projects
 - Donations of equipment & supplies
- Teacher Professional Development
 - Grants
 - Internships

MAPS

- K-12 ITE Programs
- High Schools
- CC Technology Programs
- Community Colleges

ACTIVITIES K-12

- Conventions, Workshops, Camps, etc.
- CTE Hub Activities for Volunteers

CLASSROOM MATERIALS

- Equipment Swap
- Hands-On Projects
- Curriculum
- CTE Curriculum Standards
- CTE Curriculum Framework

EXAMPLE PROGRAMS

- Articulation Agreements
- CTE Centers
- High School Programs

TEACHER DEVELOPMENT

- Teaching Jobs
- Grants
- Internships

California Technology Education Resources

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Activities - Technology Education Resources

Below are websites that list technology-related organizations, resources, curriculum, competition and other resources available to California students, teachers, and professionals. If you would like to suggest an activity/resource to be listed here on our site, please click the "Suggest an Activity" button.

Suggest an Activity

Filter results by: Location: All locations, Category: Camp, Sort results by: Program Title, and then by: None, Refresh view

| Program | Grades | Location | Category |
|---|--------|--|----------|
| Awesome Engineering Day camps from a for-profit company, AWESOME Engineering brings the REAL world to kids by relating Engineering and Construction principles to things that they see every day. In addition to learning fundamental fundamental concepts, each child is taught how to correctly and safely use a variety of hand tools. This creates a solid foundation for your child's future. | 2-6 | California Bay Area | Camp |
| EPIC - Engineering Possibilities in College The EPIC summer discipline for high school students offers an exploration of engineering disciplines using the Cal Poly Learn-By-Doing approach. Students will attend eight hands-on lab courses in various engineering disciplines, all taught by Cal Poly professors. The week will include fun activities, an industry tour, classes on college admissions and guest speakers. At the end of the week parents & friends are invited to the Student Showcase where students will proudly exhibit the engineering projects they completed. Women and other underrepresented groups in the field of engineering are highly encouraged to apply. | 9-12 | California San Luis Obispo, Ca. | Camp |
| Safe Role Science Camps (for girls) Innovative hands-on science camps for girls entering 4th - 9th grades. These unique camps provide girls an opportunity to explore science, technology, and engineering while having fun on a college campus. | 4-9 | National Selected locations nationally | Camp |

- 5) Participated in **Bay Area Community College Collaborative (BACCC)** activities. Used these venues to network with those working in CTE and disseminate information about the work of the CTE Hub.
- 6) Participated in various **meetings, conferences and teleconferences** related to my grant.
 - a) Monthly conference calls with the other CTE Hubs.
 - b) Conference calls with CACT directors.
 - c) Participated in various conferences (Career Pathways, Educating for Careers, CITEA)
- 7) **Outreach to industry**
 - a) Worked with companies in the state to strengthen connections between industry and students.
 - General Foundry
 - Tesla Motors
 - Shell, Tesoro, Chevron
 - Life Technologies
 - Wild Planet Toys
 - IBM
 - Forell & Associates Structural Engineers
 - Haas Machine Tools
 - Lunar Design
 - United Airlines
 - CALTRANS, BART, EBMUD
 - And others