



EWH CHAPTER OF THE YEAR COMPETITION REPORT

Chapter/University Name: Chung Yuan Christian University
Date: 3/31/2015

PROGRAMS/PROJECTS DESCRIPTION

Medical Equipment Design Program in EWH at CYCU

How did we start?

EWH at CYCU has started its recruitment since spring 2012. The department of biomedical engineering (BME) in Chung Yuan Christian University has held project design competition in May every year since 2011. Participation of this project competition is a basic requirement for all graders in the BME department. Most of the department advisors liked students to work on some practical inventions or developments to solve the real medical/healthcare issues in the global community.

Connecting to Engineering World Health

After founding EWH, Chung Yuan Chapter, we have been putting effort on combining the topic assigned in Projects that Matter to the BME Research Day projects. In the year of 2015, there were five student teams selected their topics from either Legacy or non-Legacy projects in Projects that Matter. The selected topics were Smart-phone based Tocodynamometer, Inexpensive Bedside Communication system, Smart-phone based Otoscopy, Inexpensive Hearing Loss Evaluating Apparatus, Portable Surgical Lamp, and Solar Sterilizers. The team which is developing Smart-phone based Tocodynamometer system has also applied for the 2015 EWH Design Competition.

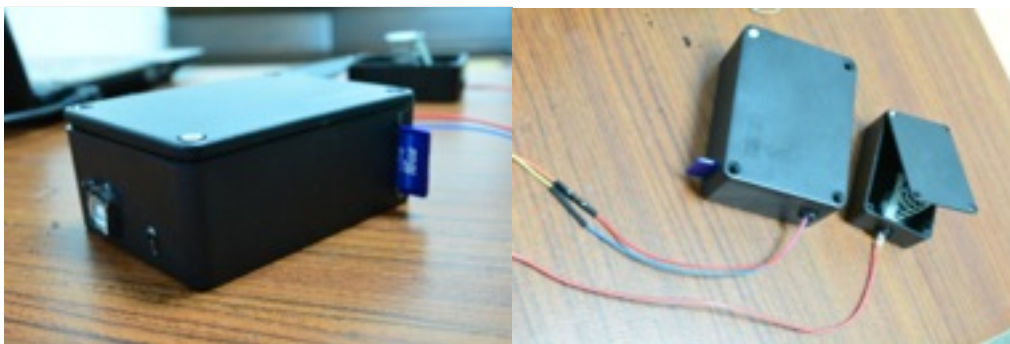
Approaching the Developments

Utilization of students in different majors brought us a new perspective of thinking about how to approach the project designs. Below are some introductions of our teams and developments:

Project #1. Smart Phone Tocodynamometer



The most left figure shown above is the user interface of the preliminary app coded in HTML5. This preliminary app was coded for calibrating between uterine activities and smart phone accelerator. The commercial available Toco-transducer developed by Philips has been used in comparison and sensitivity correction.



These two pictures above are self-constructed pressure sensing device for recording the pressure change during uterine contraction in purpose of later adjustment in the algorithm.



The team includes three students from biomedical engineering department, one from commercial design department, and a student who majors in business management

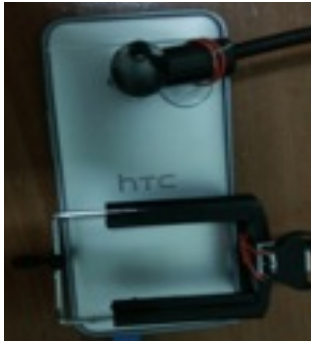
Project #2. Smart Phone based Apparatus for examining Hearing Loss

Hearing loss is one important item usually examined during health inspection. A normal apparatus for evaluating hearing loss requires audiometer and microphone for calibration. Smart Phones are common and widely used integrated device; therefore, we decided to develop a hearing evaluator on smart phone by designing an APP.



Project #3. Smart Phone based Otoscope

In order to lessen the cost of development, this development has also been developing on a smart phone App. However, for this application, it requires an additional installation of the lens on smart phone.



Kit builds

To enhance our members' knowledge about machine components, we hold a related course entitled electronic components, in which resistance, capacitance, breadboard and diode were introduced. 30 members had taken this course. Learning experiences from experiment is so important that we keep promoting it continuously.

To enhance our members' professional skills, we hold another relevant course named basic usage of welding gun. 30 members had taken this course; we learned how to weld two materials together perfectly. In the end, all members could weld the shape they like on their board and then turned on the switch to make LED lights glow. This course truly developed our members' imagination and creativity.

To make members understand how to draw circuit diagrams, we held a relevant course named DesignSpark, a kind of software which is used to draw circuit diagrams. During the class, members learned how to draw circuit diagrams. To let them know more about medical instruments, we also

provided a course about ventilator and the da Vinci® Surgical System, which enabled members to know the theory of instruments and how to operate them, and to have basic understanding of medical instruments.

STEM activities

The camp was sponsored by EWH and CYCU International Affairs Society.(IAS), and 60 children who came from Taoyuan Love-Your-Neighbor Association (TYLYNA) participated. Participating students learned scientific knowledge, engineering science, math and skills in the class, and they could apply them through hands-on experience. We hoped that through team activities and life education, the students could learn the spirit of helping each other.

The details of the activities are in the following:

- (1) During the science class, the students could learn some basic scientific knowledge from their hands-on experience.
- (2) The students could learn some knowledge about international etiquette and different countries' customs in the humanities classes.
- (3) By playing games, the students could understand the importance of helping each other and the virtue of respecting others.

The children from TYLYNA not only could learn some practical knowledge (e.g., scientific knowledge, international etiquette, country introduction, holiday introduction) but also the attitude and standard of life. At the same time, they could strengthen the friendship between each other by joining the games in this camp.

Future activities

Smartphones have become a necessity to people nowadays. Therefore, we will have the mobile app design program for members to combine the note of anatomy with the mobile app. The app will

include a diagram of muscles and nerves with their English names and pronunciations provided. Additionally, in order to make students experience how to fix the machinery, we will have the instrument repair program. An English study group is to be formed among the members of EWH to improve their English proficiency, to enhance the group coherence, and to prepare for the Palau project.

Moreover, we will invite people who have international volunteering and medical engineering experiences to deliver speeches for us so that our members can learn knowledge in different fields and develop a global perspective.

Furthermore, we are going to provide a series of lectures in spring in collaboration with the FMS-Taiwan for students to know more about the relationship between medical instruments and doctors. Now, we have the second hand instruments donation program, and we are planning to establish a platform to help foreign countries donate the second hand instruments. We hope we can receive the second hand instruments and then transfer them to other countries.

In order to improve the medical level of rural areas, we are working hard on planning to send students to hospitals in Palau as an internship, and this project is expected to be carried out this summer.

ORGANIZATIONAL ACTIVITIES

Chapter Structure and Statistics

EWH at CYCU was founded on November 19th, 2013. We now have 57 members. General assemblies, staff meetings, and ministerial meetings are held on a regular basis to organize activities and to solve problems that we encounter. The average attendance of these meetings is 80%.

In order to operate the organization effectively, we have a foreign affairs minister and an internal affairs minister.

Under the minister of foreign affairs, we have executive departments of foreign affairs, health care-related affairs and corporate public relations. Under the minister of internal affairs, we have

executive departments of IT jobs, equipment operation and academic-related affairs.

The minister of foreign affairs is mainly responsible for supervising all of the foreign affairs.

The executive department of foreign affairs is responsible for the liaison with overseas affairs.

The executive department of health care-related affairs is responsible for the contact with hospitals.

The executive department of corporate public relations is responsible for corporate sponsorship and contact.

The minister of internal affairs is mainly responsible for supervising all of the internal affairs.

The executive department of the IT jobs is responsible for website management and information update.

The executive department of equipment operation is responsible for managing equipment and writing the maintenance manual.

The executive department of academic-related affairs is responsible for medical equipment courses and special topic competitions.

Fundraising approaches

We introduced EWH to our alumni in order to have more alumni sponsor EWH; therefore, we can continue to implement our plans. So far, our alumni sponsored about 200 U.S. dollars totally. We planned to reach every alumnus by email, hoping to raise more funds.

Other chapter activities

In order to enhance our group coherence, we held a trip in autumn. To expand the opportunity of overseas services, we also organized a trip to the Ministry of Foreign Affairs jointly with the International Affairs Society. 50 students participated to this event, including the members of EWH.

We made great effort to let our members know how to use the medical equipment and organized a visit to the Long-term Care Management Center. After this activity, we also learned that biomedical engineering can do many things, such as the invention of the automatic lock system.

We organized a lecture on the history of biomedical engineering and invited Mr. Wai-Yang Wei

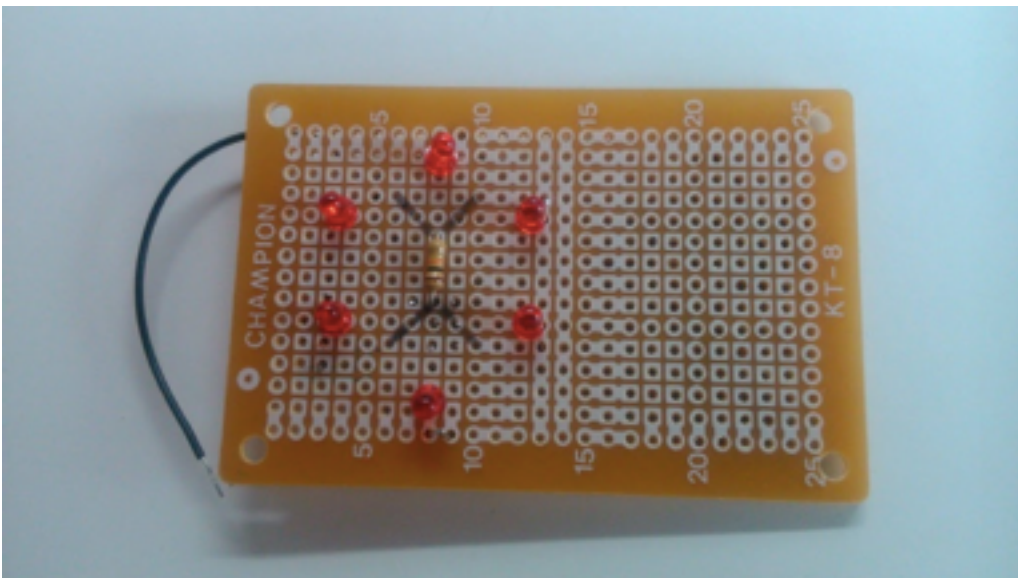
to be the lecturer. This lecture helped our members understand the history of biomedical engineering and develop links with the people in biomedical engineering.

We held a seminar to introduce EWH and attract more people to participate in the affairs. More than 20 people were attracted to join EWH. We have also recruited many students from the Department of Applied Linguistics and Language Studies and the Department of Information Management since we expect EWH to be a platform where everyone's skills may be put to good use, and all kinds of talents and resources may be exchanged and employed.

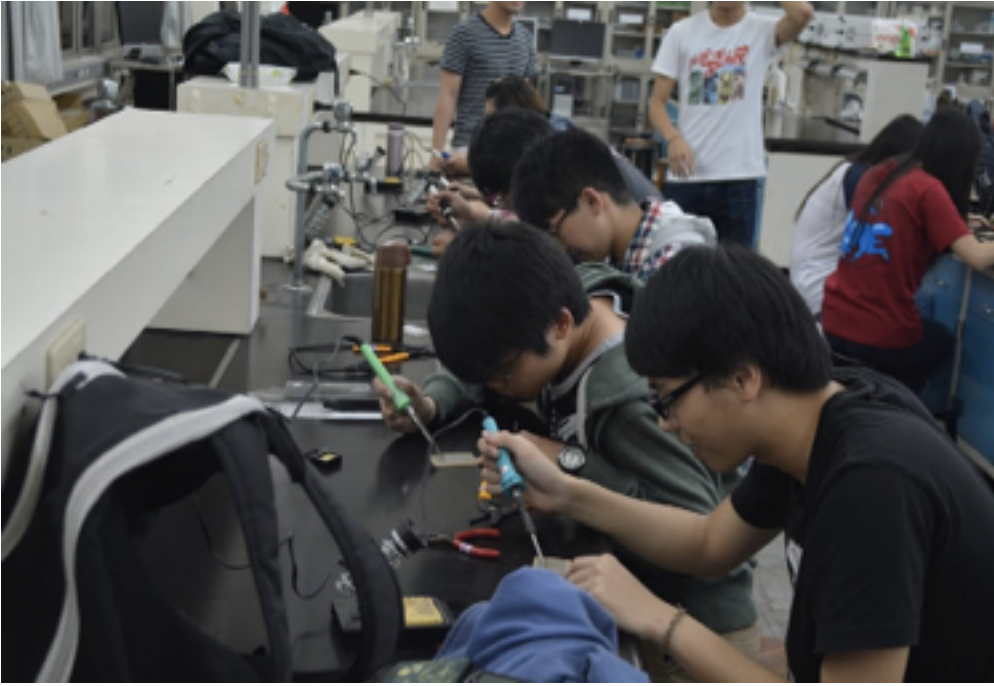
APPENDIX - PHOTOS, TABLES, SCHEMATICS AND ADDITIONAL MATERIAL



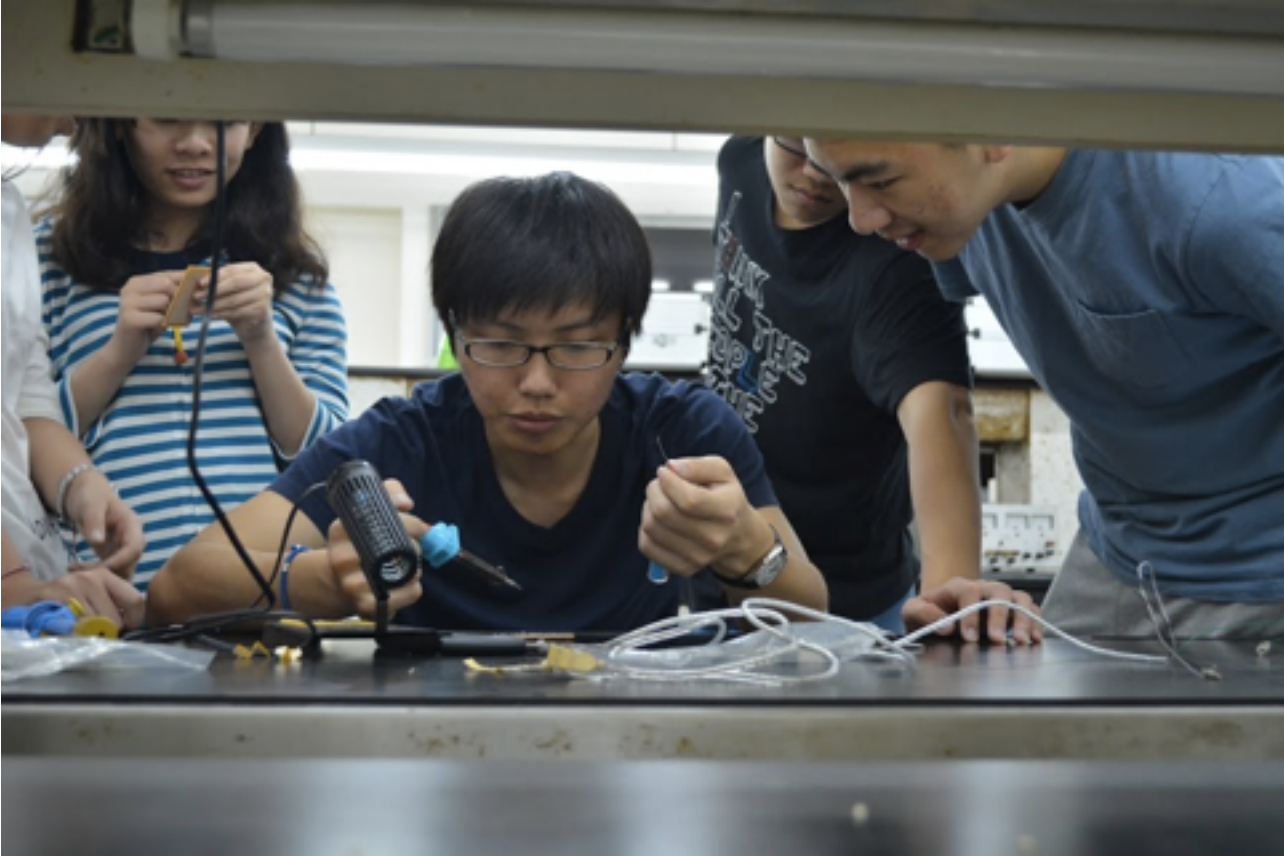
Kit builds-Electronic Elements March 13,2014



Kit builds-Electronic Elements March 13,2014



Kit builds-Soldering Iron Usage March 28,2014



Kit builds-Soldering Iron Usage March 28,2014



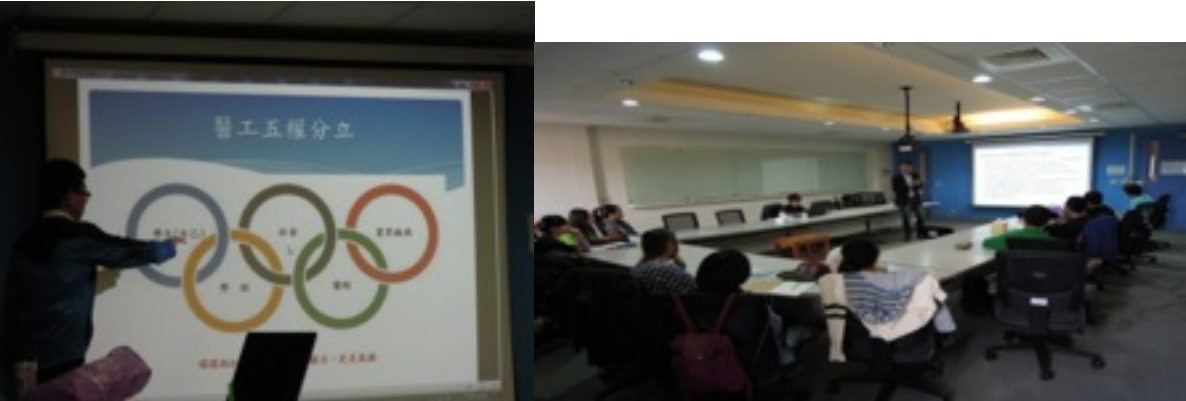
Kit builds-Soldering Iron Usage March 28,2014



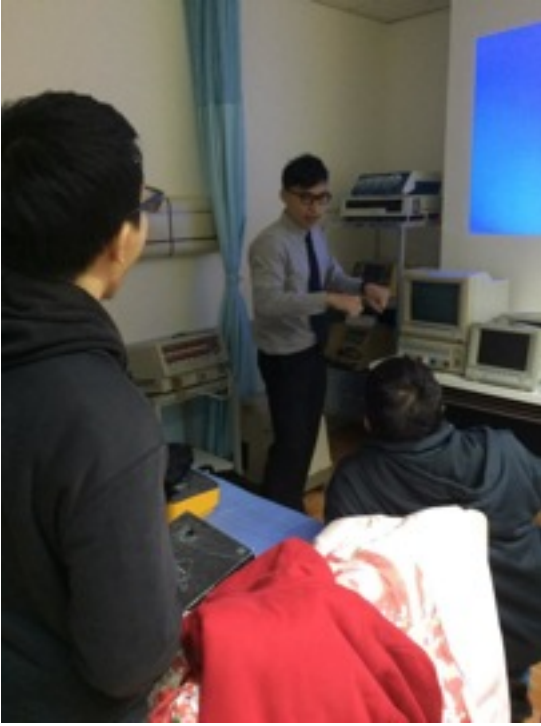
Kit builds-DesignSpark Tutorial April 10,2014



Kit builds- actual operation of ventilator October 1,2014



Kit builds-The da Vinci® Surgical System and hospital internship experience sharing December 3 , 2014



Kit builds-actual operation of Electrosurgical Unit December 24,2014



STEM camp,January 2015



STEM camp, January 2015



STEM camp-international etiquette class, January 2015

<https://drive.google.com/file/d/0BzQ6tEvpGAoCR2Vhd0xGRmMzU1U/view>

STEM camp activities record



Chapter Structure of Chung Yuan Christian University Chapter

Total Jobs & Responsibility Catalog

President	
1.	Supreme Coordinator
2.	Review Official Documents
3.	Host Organization Event
Director of Diplomacy	
1.	Host Organization Event
2.	Supervisor of Diplomatic Affair
Director of Administration	
1.	Host Organization Event
2.	Supervisor of Administration
Group of Executive and Public Relation	
1.	Pre-contact with External Organization
2.	Public Speech
3.	Organization Documentation
4.	Arrangement of parliament

Group of Human Resource	
1.	Management of staff position
2.	Offering the membership certificate
3.	Arrangement of Interview
4.	Case Payment Distribution
5.	Member Agreement and Offer Letter
Group of Finance	
1.	Property & Finance Recording
2.	Membership Fee Collection
3.	Purchase of Organization Essences
Department of Foreign Affair	
1.	Following Assessment with Foreign Organization
Department of Hospital Affair	
1.	Following Assessment with Medical & Health Unit
Department of Sponsorship	
1.	Management of Sponsors' List
2.	Inform and Send Updates to Members & Sponsors
3.	Assessment of Sponsorships
Department of Internet Technology	
1.	Server Maintenance
2.	Update information to the web
3.	Electronic Document Management
4.	Website Design
Department of Equipment Management	
1.	Purchase of Equipment Component
2.	Equipment Classification and Management
3.	Repair Medical Equipment
4.	Build Standard Operational Procedure

5.	Equipment Flow Management
Department of Academic Orientation	
1.	Open Course of Medical Equipment
2.	Create ToDoList for Project Design Competition
3.	Coordinate “Projects that Matter” projects with academic projects



Fundraising approaches



Fundraising approaches



Other chapter activities-trip to the Ministry of Foreign Affairs jointly with the International Affairs Society, November 25, 2014



Other chapter activities- poster of the trip to the Ministry of Foreign Affairs, November 26, 2015



Other chapter activities-lecture on the history of biomedical engineering, May 21,2014