

CETI 2006
Final Report

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Introduction

Over seven weeks, we visited three universities in Western China through the MIT China-Education-Technology-Initiative (CETI) OpenCourseWare (OCW) Program. The three schools were: Kunming University of Science and Technology (KMUST) in Kunming, Yunnan; Sichuan University (SCU) in Chengdu, Sichuan; and Qinghai University (QHU) in Xining, Qinghai. Our primary goal was to introduce to them the distinguished educational technologies and traditions of MIT, through offering several courses using materials from OCW.

Amos' Evaluation of His Class (*Introduction to Environmental Science*)

Over a span of two to three weeks' time (three at KMUST, two at SCU and QHU each), I introduced to the students the fundamentals of environmental science. Topics covered included greenhouse effect, global warming and acid rain, with the use of scientific concepts such as conservation of mass and chemical equilibrium as tools to understand the underlying principles behind these environmental phenomena, as well as to spell out the possible solutions to environmental problems. A debate on causes of and solutions to global climate change was held among the students.



KMUST: Being taught how to make dumplings / With students at the main campus

At KMUST, the biggest problem I encountered was the academic background of the students. My plan was to introduce quite a lot of relevant mathematics, physics and chemistry instead of giving a qualitative account of environmental science as in many universities. Interestingly, all of my students were majors in humanities subjects such as law and English, and had had little exposure to math and science. To tackle this problem, I managed to remove the hardcore math from the materials, switching focus slightly towards the biological aspects of environmental science that required less math, but still maintaining the essence of the course. It turned out that the students enjoyed and gained a lot from the course without being hindered by the intensive mathematically advanced materials. I believe this course not only has aroused their environmental concerns but also has added significantly to their academic experience by exposing them to an area outside their majors. If I have to make some recommendations, I would highly encourage better communication between the MIT teams and the schools about the students' basic academic background for the class, so that the instructors can prepare accordingly.



SCU: Debating on the causes of global warming / Adjudicators of the debate competition

At both SCU and QHU, the students had a much more relevant academic background. Many of them were environmental science or engineering majors, so I brought the more mathematically advanced materials back to the syllabus. The students were very motivated and smart, able to digest the materials quickly and enrich the class with insightful questions and intuitions. As in KMUST, language barrier was sometimes a problem because the students had little experience in learning in English. I gradually overcame it by adjusting my speed, repeating the important points several times, and using Mandarin occasionally to speak of technical terms that were first introduced. I knew from the students' feedback that they really cherished this exposure to an American (and MIT) style of education, which was far different from their conventional

academic experience, let alone the opportunity to be immersed in an English-speaking atmosphere.



SCU: Talking about global warming / Helping a student with environmental chemistry

Materials from OCW were constantly used or referred to in preparing and presenting the lectures, particularly from course 1.018 and 1.061. Students were amazed by the cornucopia of web-based knowledge offered through OCW, which many of them found very relevant and useful for their future studies. Directly used from course 1.018 included the materials on the global climate change debate, which the students needed to prepare their arguments for their teams. Despite the fact that their spoken English was not very fluent, students at all three universities tried their very best to communicate and support their views with sound scientific arguments. I was very impressed by their active participation and what they gave to the class.



QHU: Last day of class

James's evaluation of his class (*Introduction to Product Design*)

As a summer 2006 CETI participant, I taught an intro to product design course based on the MIT mechanical engineering 2.009 product engineering processes course taught by my advisor Professor David Wallace. Given the only 2-3 weeks spent teaching at each university, the curriculum was extremely condensed and accelerated. Students spent the first week learning and performing the basic product design processes, including choosing a project fitting the theme of improving the lives of college students in China. The remaining week (or two) was devoted to designing and building a sketch model of the product for a public final presentation.

My students at KMUST were a mix of marketing and various other non-engineering majors, so adapting a senior-level mechanical engineering curriculum to suit them was a challenge. I tried to help as much as possible while still giving them the opportunity to experience the product design process for themselves. That being said, I was quite pleased with the students' hard work and willingness to apply themselves in unfamiliar ways.



KMUST: Final class photo / Yellow team with their study pillow sketch model

Of the three schools we visited, we spent the longest time (three weeks) at KMUST and developed the strongest relationships with the students (and faculty) there. They were extraordinarily friendly and hospitable, taking us out for dinner, tea, parties, and extravagant sightseeing trips and seemingly never tiring of spending time with us. It was a good start.



KMUST: Playing soccer with the students / Sampling some Yunnan cuisine

We arrived at Sichuan University with high expectations and were not disappointed. Almost all of my students were mechanical engineering majors with even a few graduate students thrown in for good measure. They took the course very seriously and worked hard to produce some impressive results. As a class they single-handedly validated my curriculum, much to my relief. Given their motivation and abilities, I adopted a more hands-off approach and spent most of my time just documenting their progress and making sure they kept on track for the final deadline.



SCU: Final class picture / Red team with their wind-proof hanger sketch model

Although we had some initial problems with scheduling and facilities at Qinghai University, all issues were eventually resolved. The students at Qinghai University were very sincere, but seemed to lack the background and motivation to make the most of the curriculum. However, they were exceptionally attentive and, with a little help, they produced some promising results.



QHU: Final class photo / Yellow team brainstorming session

Orian's evaluation of his class (*Bicycles and Basic Principles of Mechanical Engineering*)

“Bicycles and Basic Principles of Mechanical Engineering” was a course designed to give a basic understanding of simple mechanical engineering principles to students beginning their studies in mechanical engineering or to students in other fields looking for an introduction to mechanical engineering. The course was split into labs and lectures with students expected to spend about half their time in each. Lectures were designed to cover equilibrium, stress strain relationships, St. Venant's principle, and also some selected topics on bicycle design. In lab students were to work in groups to build bicycles. While building bicycles the students were to reflect on principles we discussed in lecture and think about how they influenced the choices made by engineers who designed the bicycles.



Bicycle disassembly / Group photo

To implement the curriculum there were several challenges that had to be overcome. Some of these were anticipated, like difficulty in communicating with the students in English. Other

challenges were harder to anticipate and needed quick changes in the curriculum and teaching style to overcome. The most difficult of these challenges was working around the different experience levels of the students. Moving from one university to another usually meant a near total retooling of the curriculum and within each university the course needed to account for the range of the enrolled students' experiences.

At Kunming University and Qinghai University our students were freshmen. This helped to narrow the gap between students' understanding of mechanical engineering, but there was a large gap in English language proficiency at both schools. This problem was in large part solved by writing everything on the blackboard or showing the written information in PowerPoint. The students' ability to read and write was much more uniform than their ability to speak and understand spoken English. A course website was also posted with lecture notes and Open Courseware materials to help any students who had trouble understanding the spoken English or the material in lecture.



Culture lecture / Assisting a lab section

At Sichuan University we had the opposite problem. Students at Sichuan all spoke and understood English very well but the students enrolled in the course ranged from freshman economics majors to mechanical engineering post doctoral students. The introductory mechanical engineering curriculum was not sufficiently challenging for many students enrolled in the course. To keep the class interesting to students with past knowledge in mechanical engineering and also to students who had not studied mechanical engineering at all the course material was changed to primarily cover bicycle design and especially changes that have been made in bicycle design over the last two hundred years. Since less Open Courseware materials

were used for the material in the new curriculum one lecture was dedicated entirely to discussion of MIT Open Courseware and China Open Resources for Education.



Demonstrating the importance of asking questions / Bicycle class lab section

Overall the students responded very positively to the class and the changes to the curriculum were successful at each school. Both students and faculty from all the schools were excited about the course and said they looked forward to similar courses with MIT students in the future.

Interactions with the Schools

At all three universities, the helpers from the schools offered us a tremendous amount of support in various ways. The administrative staff and teachers not only helped us with facilitating the classes but also took very good care of many aspects of our everyday life. If not for their continuous help, advice and support our teaching experience would not have been as smooth, successful and fruitful.

For instance, at KMUST, the administrative staff helped us a lot in the purchase of train tickets, which we found slightly tough for us to do alone in an unfamiliar city. The Vice-President of the college (namely Oxbridge College) showed us a very warm welcome, sparing no efforts in helping us adjust to the local life of Kunming. We were very impressed by the immense emphasis they laid on our visit. In spite of the fact that their school site was undergoing many construction works, they made sure that we lived comfortably and satisfactorily. Sometimes we did feel that the intensive series of events they planned for us was a bit overwhelming, but after effective communication we came to an equilibrium at which all of us enjoyed our interactions to the full extent.

Western China has her distinguished awe and beauty different from the rest of China. All three universities have ensured that we would not miss the essence of this blessed piece of land. In the helpers' company and with their guidance, we visited breathtaking places such as the Stone Forest, Qinghai Lake, and saw the Great Panda, to name but a few of the most memorable outings. These visits became a very memorable part of the whole trip.

Interactions with the Students

Interaction with students outside of the classroom was one of the most rewarding parts of our summer with CETI. Not only was it a good chance for us to practice our Chinese and for the students to practice their English but it was an excellent avenue for cultural exchange. Students would commonly share stories of college life in china with us over a bowl of noodles after class and we would share with them stories of our life in the United States and stories about studying at MIT.

At Oxbridge College in Kunming we had many outings with students planned for the weekends. Aside from the rain these outings were a good chance for us to spend a day with students at an interesting place around Yunnan. The best of these outings were a trip to downtown Kunming and a trip to Shilin (Stone Forest).



With students in downtown Kunming / With students at the Stone Forest in Yunnan

At Sichuan University and Qinghai University we planned fewer outings but whenever we had free time students would invite us to eat or to see town or to explore the university with them. At

Qinghai University we were especially lucky to have a kitchen where we were living so students could come over and cook with us after class.



Hotpot with Sichuan University students / Basketball game at Qinghai University

Even though we were busy preparing for classes and grading homework much of the time we made sure to have time to interact with students. In many ways it seemed that both we and the students learned more from each other just hanging out than actually in class. If nothing else we all made lots of friends!

Amos' Personal Reflections

This trip in China is definitely one of the most valuable and memorable experience in my life. Through the teaching of OCW and self-developed materials, I found out that I really love teaching! Education (and research) should be what I would like to do for a career. Although I encountered a wide spectrum of difficulties during my class, I learned to adapt to the different paces and needs of the students, and improve my speech and styles. As an instructor, I always reminded myself of this motto, “people don’t care how much you know unless they know how much you care”, so that I would not forget the importance of making friends with the students. In the end, I really felt the love of the students through their words of appreciation, their gifts, and their affectionate attitudes.

I was brought up in Hong Kong, which has always been politically and socioeconomically distinct from the rest of China. Only after this trip have I truly developed this strong emotional attachment to my motherland, and found out how much I love this country. Seeing the economic advancement of China, I am overjoyed. Witnessing people’s negligence of the deteriorating environment, I am stunned and hurt. I only wish as an environmental scientist I may help people understand the importance of protecting this blessed piece of land.



The Yellow River at the Kanbula Geological Park, near Xining, Qinghai / Hiking in the Yaozigou Forest National Park near Xining, Qinghai.

James's Personal Reflections

CETI 2006 was seven weeks of the best summer of my life. It allowed me to combine several of my greatest interests: teaching, being creative, meeting new people, experiencing new cultures, and traveling.

Although there were times when things didn't go exactly according to plan or expectation, everything always seemed to work out in the end. Take for example the time when my teaching partners and I understood that we were going to a party thrown by our hosts, but instead ended up giving a 2 hour lecture to a room full of students and parents. I think we did a pretty good job under the circumstances and we learned a valuable lesson about staying flexible that prepared us for various future occasions. In fact, it was just such challenges that made the CETI experience so rewarding.

Possibly the best part of CETI for me was the opportunity to work together with such great teammates, Amos and Orian. I felt that I could count on them to help me out whenever I needed and I believe that by the end of the program we were able to work together not just as teammates, but as friends.

Then of course there were the students, who made all the preparation and work worthwhile with their enthusiasm, trust, and friendship.



With Michelle in Kunming / At home in Xining

Orian's Personal Reflections

I've had a lot of opportunities to volunteer and to travel places outside of the United States in the last few years. Every experience I've had has been great, this one included. Each one is different too. I can't say that this summer was particularly better or worse than other experiences I've had but it certainly provided for a lot of new experiences that will be very valuable for me.

China is a very important country and it will only become more important in the future. When I first learned about CETI it was this that made me so interested in going along. I wanted to get a feel for the people and the culture of the country because when I graduate and head out to work somewhere I expect I'll have a good deal of interaction with people from or in China. I feel like in this purpose my summer was very successful.

Beyond getting to know something about China I also learned things about myself during this summer's program. Any time I'm placed in an environment different from the one I'm used to here at home in the United States I'm made much more aware of the things that take for granted or view as normal here. It's always good for me to look at myself through the eyes of another culture and to re-evaluate aspects of my life that I would never even think of if I always stayed at home.

So in the short form: I had a great summer in China with CETI, and now that I've been once I can't wait for my next chance to get across the Pacific Ocean!



Orian in Qinghai