
GC 2012-5612: CROSS-CULTURAL ACTIVE LEARNING: PRELIMINARY RESULTS OF A CASE STUDY OF AN AMERICAN PROFESSOR TEACHING IN CHINA

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Cross-cultural active learning: Preliminary Results of a Case Study of an American Professor Teaching in China

Abstract

The case of the first days of cross-cultural active learning experience in engineering is explored. Specifically, an American professor taught Electronics in English at a university in China to sophomore students whose native language is Chinese. Students who excelled academically and in English were chosen to participate in this course. The instructor carefully prepared the first class introducing herself, her teaching methods, and the topics. She also had the students introduce themselves and work on some circuits problems. Overall, the students were enthusiastic about the class. Most chose to take the course to experience a different teaching method with many wanting to improve their English and to prepare for study abroad. They expected a more interactive in-class atmosphere and that the English language would be the greatest challenge. At the end of the first class meeting, most of the students said they could understand the instructor well. One-third said it was more difficult than expected. Students liked the communication in the classroom highlighting the introductions, the relaxed and active atmosphere, and interaction between teacher and students. About half the class cited English language problems as a challenge. Some students admitted that they had forgotten some material from the previous circuits class so had trouble with the in-class problems. Reflections from the instructor, assistant instructors and administrators showed that the teaching method was appealing to the students and that the students were able to actively participate in the active learning activities.

Introduction

Active learning is well established as an effective pedagogy in many parts of the world including the U.S., Australia, and Europe^{1, 2, 3}. Less work has been done in Asia and specifically China. Some work has been done in Taiwan⁴ and comparing Hong Kong and mainland Chinese construction engineering students.⁵ Individualistic approaches may be more familiar to Taiwanese students⁴. Leung et al.⁵ suggest that mainland Chinese construction engineering students may “have an internal disposition to use metacognitive skills in the learning process, so they are not fully dependent on the teaching approaches used by their educators. (p. 144)” However, it is not clear if this is related to the high selectivity of the engineering programs and/or the system where individual tests have played such a large role in defining success.

Although popular misconceptions persist that Asian students are rote learners and resistant to innovative active pedagogies, research has shown this to be untrue for students in Hong Kong.^{6, 7} Researchers advise caution in comparing educational experiences across cultures. Thus, rather than comparing, we are focusing on the experiences of the Chinese students in this course taught by an American professor using active learning techniques.

How well do active learning techniques work for engineering students in the culture of China? This work explores that question through a case study of an American professor teaching Electronics in English at a university in China to students whose native language is Chinese. The students are sophomores from the Honors College, School of Information Sciences and Engineering, and School of Electronic Sciences and Engineering. This paper focuses on the beginning of the course including the responses of students and faculty. In the next section,

details of the course itself and the students are described. The following section examines the responses of students to a survey given right before the class started and at the end of the first class meeting. Faculty responses are in the next section including the expectations and experiences of the instructor, two assistant teaching instructors, and administrators from the students' departments. The paper concludes with a discussion.

Course Context and Logistics

The Fundamentals of Electronic Circuits course is a very important fundamental required course for second year engineering students. It has 64 credit hours, four hours per week for 16 weeks. Upon completion of the course, students will be able to analyze and optimize basic electronic circuits.

For this course taught in English, the Chinese faculty wanted the American professor to teach the course as similar to how she teaches it in the U.S. as possible. Some adjustments were needed since the course at her university in the U.S. is Electronics I followed by Electronics II with each semester being 3 hours a week for 14 weeks. In the Chinese university, there is no Electronics II. The longer semester in China did permit inclusion of some topics from Electronics II in this course specifically feedback, active filters, and frequency response of transistors. Electronics I covers diodes, OpAmps, transistors, transistor amplifiers, and multiple transistor circuits including amplifiers, current sources, and differential amplifiers.

The grading was done using the U.S. instructor's method of including homework (15%), two midterm exams (20% each), a final exam (35%), and the laboratory (10%). In this university, the final exam supposed to be at least 60% of the final grade, there is only one midterm, and homework counts for little. In the U.S., this laboratory is a part of the course and is usually taught by the same instructor. In China, this laboratory is taught in the Electric and Electronics Experiment Center and students receive a separate grade for it. For this course, the lab counted as 10% of the final course grade while in the U.S., it is typically 25%. One of the teaching assistant instructors taught the lab with input from the U.S. professor including some of her labs and some of the typical SEU labs.

Students

All the students come from three schools, the School of Information Sciences and Engineering, School Electronic Science & Engineering and Wu Chien-Shiung College, the Honors College at this university. There are typically separate courses offered by each of the Schools and the honors College with slight variations in content. For the course in English, students from the three areas were combined, something that is quite unusual at this institution.

The course was advertised to all students in these Schools and College and students could chose to apply to take the course instead of the typical course on these topics offered in Chinese. Students were then chosen to attend this course according to their scores in some related courses including Physics, Fundamentals of Circuits, and Digital Circuits, as well as their English level and their overall grade point average (GPA). At this first class meeting, 51 students attended and 46 signed the class list. By the end of the second week, the enrollment settled at 37 students. The thirty-seven students include 27 men and 10 women with 5 from the Honors College, 10

from the School of Electronic Sciences and Engineering and 22 from the School of Information Sciences and Engineering.

First Day of Class

During the first class meeting, the instructor introduced herself, her family, her teaching methods, and went over the syllabus in detail. This included the learning objectives, homework teams, grading policies, and midterm exam dates. She also had each student introduce him or herself stating name, what they want to be called (i.e. English name), School or College, and a fact about themselves.

In describing her teaching methods, she talked about the importance of participating in class. She explained that sometimes students would work with the person next to them, their “helpful neighbor” to do problems in class, rather than waiting to do them for homework. That way, she can answer questions and they can be sure they understand. She also explained that sometimes she may call on students. The goal of this is to gauge their understanding, not to embarrass them. If they do not know the answer or are having a terrible day, that is fine. However, they must pass to another classmate by name. This insures that they get to know other students in the class. Cooperative learning homework teams are assigned by the instructor in the second week of the semester and used throughout the course. These teams of three to four students submit one homework solution and alternate playing the roles of Coordinator, Monitor, Recorder, and Checker.

Then the instructor began talking about the technical course material by giving an overview. The last part of class had students work with their “helpful neighbor” on review problems from the Circuits class they had all taken the previous semester.

Student Responses (Expectations and Experiences)

To explore the students’ perspectives, the instructor had the students complete two surveys on the first day of class. Before the instructor introduced the class, the students completed a survey in Chinese asking about areas such as their prior experience with English, motivation for taking the class, and thoughts about the course. They completed another short survey in Chinese at the end of the two-hour session reflecting on the experience. Forty-four completed the pre-survey. 41 completed the post-survey. We chose to have them write in Chinese so that they would be more comfortable and hopefully provide more detailed and honest answers. Responses were then translated into English and analyzed.

Presurvey

Seventy-five percent of the students rated their English knowledge as “Good” or “OK”. Ninety-percent of the students said they had studied English for at least 8 years. Twenty-five percent of the students had previously taken a college course in English, specifically Physics that was offered in a bilingual form at this university.

The most common reason cited for choosing to take this course was to experience a different teaching method (61%). Other common reasons were to improve English (34%) and to prepare for Study Abroad (32%) with some specifically mentioning graduate school.

When asked what they expected would be different about this course, the most common response was the teaching method (43%) with several saying they thought it would be more “vivid”. 30% thought the in-class atmosphere would be different and include more interaction, enthusiasm or being more active. Twenty-percent thought there would be more communication between teacher and student and twenty-percent mentioned the English language.

The most commonly cited challenge was the language (64%) including concerns about comprehension as well as ability to express oneself in English such as “can’t understand and can’t keep up with the teacher’s thoughts”. Another 18% specifically mentioned being worried about understanding technical terminology in English. Since most language classes do not include technical terms, this is understandable.

In response to the question of what they hoped to gain from this course, 41% said improving their English with another 9% specifically mentioning spoken English. 39% said they hoped to gain knowledge of the course material (Electronics). Eleven percent said they hoped to experience a different teaching style and another eleven percent said adapt to an English lecture. Four students (9%) hoped to get a good grade.

The sophomores in this class are already thinking about their future after graduation. 93% said they planned to go to graduate school. Many of them hope to study abroad (68%) with seven (16%) specifically mentioning planning to go to graduate school in the U.S. Only a few mentioned getting a job right after school.

Post Survey

At the end of the first class meeting, 88% of the students said they could understand the instructor well. 33% said it was more difficult than expected.

When asked about the best and most challenging parts of the first meeting, students gave a variety of responses. The vast majority (79%) commented positively on the communication in the classroom highlighting the introductions, the relaxed and active atmosphere, and interaction between teacher and students. 33% particularly liked the self-introductions but 7% found these challenging. 48% cited English language problems as a challenge with 29% specifically mentioning English terminology. 10% admitted that they had forgotten some material from the previous circuits class so had trouble with the sample problems.

Faculty Responses (Expectations and Experiences)

Instructor

Before the class, the instructor was concerned that the students’ English would not be sufficient for them to follow her. She knew she would need to speak slowly. She expected that most students were motivated to take the class because of an interest in going to graduate school in the U.S. or another English-speaking country. She expected that the students would be very smart and particularly good at mathematics. She was worried that the students would be uncomfortable with the active learning techniques used in the class. Thus she took some time on the first day to explain why she was using these techniques. She carefully planned her first day activities to help the class get to know her, meet each other, learn about how she teaches and what technical topics will be considered.

In the first class, the instructor was impressed by the students' willingness to speak in English and to engage with her and the sample problems. Although some students were more comfortable with English than others, all said several sentences about themselves during the self-introductions. In fact, this took much longer than she had expected. Most students knew how to do the problems but some had trouble explaining in English. This could be due to difficulties with the language as well as the lack of familiarity with having to do detailed explanations.

Assistant Instructors

One faculty member from each of the students' home Schools was assigned to help the instructor throughout the semester. They attend the class and help when needed.

School of Information Sciences and Engineering

"When I found out that I would be a teaching assistant for Professor Lord, I was excited. I have taught this Electronics course at Southeast University for many years. I am eager to learn new ideas and ways to teach this course and how to make the students more active during class hours.

The first class gave me a fresh experience. There were a lot of interactive during the class. All the students are attracted by the instructor's humorous conversations, interesting teaching contents and lively style. Before the first class, some students were afraid of this difficult course and the language obstacle. After the first class, most of them felt it was a very valuable and interesting course."

School of Electronic Sciences and Engineering

"Before the first day, I have learned about some teaching methods in the United States from the internet. But I think that some of the students may not understand the teacher very well because of the language. I am also worried that many students would be shy to communicate with the teacher and make the course not active.

The teacher began the introduction of her family and background. This is friendlier to the students, rather than directly telling them that the course is important, difficult and not easy to pass, which will bring the students some sense of fear of the course, and may not be helpful for getting them excited to learn the material. The teacher emphasized teamwork. For example, a group has four students to finish the homework; every member has his or her duty. Another example is that students do the labs in pairs. This is very rare in the usual classroom education in China. But I think that this way is very good. Teamwork skills are as important as their knowledge when they go to work."

Administrators (Deputy Deans)

School of Electronic Sciences and Engineering

"Today, more and more excellent students select to go abroad to pursue their Masters or PhD degree after graduation from our School. But, most of them are not sure that if they will be able to be successful in studying abroad. We want to do more to help them to make such choices and understand foreign universities and their studies.

Our School and university have been making more efforts recently to invite professors from different countries to come to Nanjing and teach our students. The courses taught by foreign professors are mostly focused on their research areas and the students are mostly juniors or seniors. Now we are happy that we can invite Professor Lord to come to SEU and teach the EE fundamental course, Electronics I. This is our first experience organizing a fundamental course completely in English for our sophomore students.

Another reason for us to organize courses in English is that most courses given in Chinese universities lack interaction. We encourage our teachers to care more about the process of the course, not only the final examination score. But there are not many teachers who have experience with active learning so we can learn a lot about how to organize interactive learning from other universities, especially from foreign instructors.

Because Chinese primary, middle and high schools pay much attention to teaching English and Chinese families regard English as very important, many Chinese students have already developed quite good English capability before they enter university. But there are still more than half of the undergraduate students in SEU whose English is not good enough for them to take a course in English. Even for the students with good English, whether they can understand professional speech is still a question. I supposed that they would need some time to get used to it. As for the interactive learning, I do believe that most Chinese students can accept it. There are always students who are good at and willing to express themselves.

Therefore, only the students with good English background were selected to join Professor Lord's course. I hope they can enjoy the American way of interactive learning with Professor Lord and I have confidence that most of our students can pass this course with nice scores.

Before the first class, I saw that some of the students were both excited and nervous. Professor Lord was very good at interactive learning. She started the English introduction of herself and this course with the speed not too fast and helped our students to speak. The introduction to the rules of the team organization on homework and the way to pass unknown oral questions to other students seemed quite new to me. I did not hear about them from any of my colleagues before.

Later in this lesson, Professor Lord reviewed some contents in circuit design. Because more professional terms appeared, some of the students cannot keep up easily. They need to be trained to be more familiar with these terms. Overall, most students believe that they can keep up with Professor Lord later based on the experience of the first day.”

Wu Chien-Shiung College

“When information about this class was first issued at the end of last semester, very few students in Wu Chien-Shiung College applied for it. This cold response was puzzling. Why are the students reluctant to try a new class style, even though they are the most excellent ones at SEU and some of them want to study abroad? After discussions with some of the students and the faculty, there seems to be three possible reasons. First, some extra pressures instead of insufficient confidence in their ability or laziness prevented them from selecting freely. Unlike students in other schools, they have heavier burdens and have to make choices including selecting future majors, competing to be graduate students without examination, etc. For each of

these, high grades are critical. Second, since they have strong desires to excel, they expressed a rather cautious attitude when they were not sure if they can definitely get high grades in this class. Third, there are certainly some students, even excellent ones, who are only willing to do things they consider 'useful'. Before they have decided to go abroad, a class in English is not 'useful'. However, for whatever reason, I think we cannot blame students only. Maybe this situation reminds us that we should construct a more open environment for them to study and to have courage to try to prevent their being completely utilitarian.

The second lecture began with an introduction to diodes. From some widely used display devices, applications of LED, Professor Lord introduced the new electronic component, the diode, and then introduced some semiconductor and some related concepts such as doping, electron and hole. The professor explained these concepts vividly by asking students and tutors to play with her. She also provided some small exercises in class for students to do.

Professor Lord would like students to develop good understanding of the concepts or principles in class, so she tried to make them simple and explained in detail. Students might feel easy and more relaxed. Regarding the interaction, most students can understand the professor and participate in active thinking, but it is still difficult to speak their ideas fluently. So oral expression with academic English is still an obstacle for interaction in this class.”

School of Information Sciences and Engineering

“It would be a good opportunity to know the way this course is taught in the U.S. Electronics is one of the most difficult courses for EE student in China, for it contains many engineering concepts and methods, which the students are not familiar with. So we would like to see a different approach for this course. Through the experience of this particular offering of the course, we can see if there is any possibility to change the contents of this course. For example, should we divide them into 2 or more courses? Maybe the students do not necessarily learn all the contents in our course. This also gives the students a good opportunity to study in a new way. This is not only in the language, but also in the way they study.”

Discussion

Overall students responded well to this first class in English taught by an American professor using active learning techniques. From the perspectives of the instructor, faculty assistants, and administrators in the students' Schools or College, the teaching methods seemed attractive to the students and most of the Chinese students had the English skills to actively participate in self-introductions. Most were able to do the technical problems but there was some understandable difficulty in expressing themselves in English.

An entire fundamental course taught by an American professor is a new endeavor for this Chinese university. The students in this particular class are excellent academically and in English and want to try a new way of learning. The professor is very experienced with research and practice in encouraging active learning. So this course is likely to be successful. Further study of student responses throughout the semester are being carried out and will provide a richer picture of the overall experience. However, questions do exist about how to do more widespread systematic reform in this environment.

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