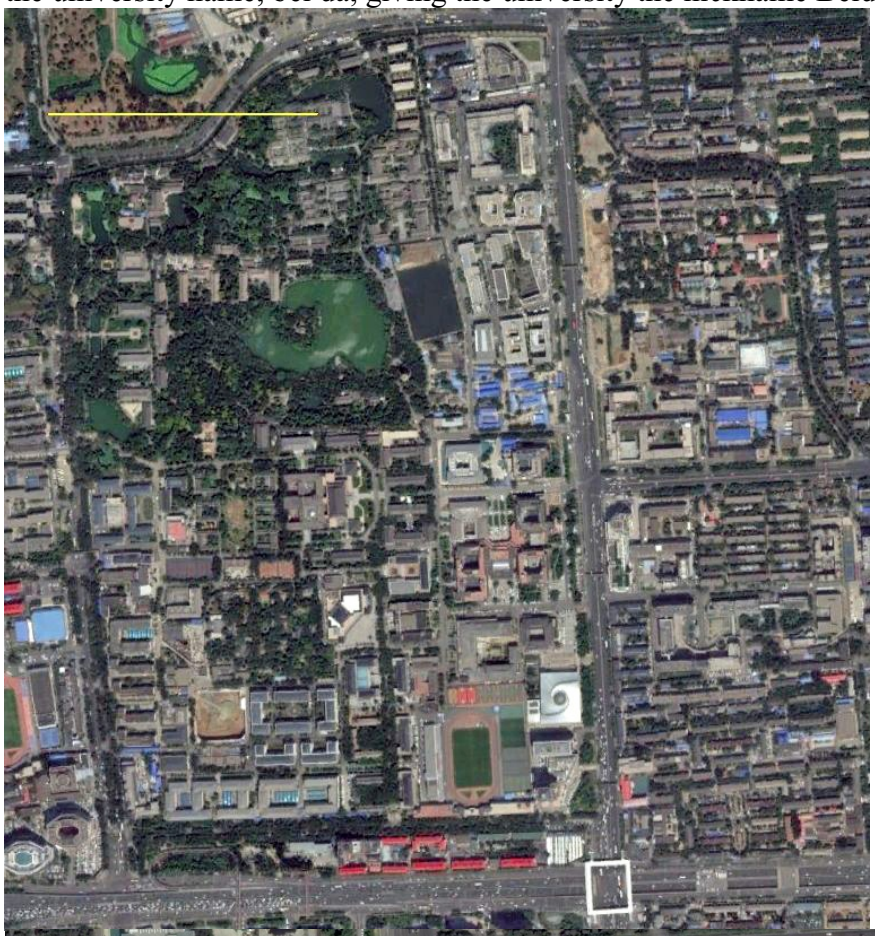
Teaching at Beida

In early 2017 the - - - organization (name withheld by request) arranged for me to teach a science course at Peking University during July. I was pleasantly surprised and regarded it as an honor, knowing that it was one of the top two universities in China. I was notified of the assignment on March 7.

As the symbol indicates, Peking University has a history of more than a century. It retained its old English name when the city name was changed to the more accurate Beijing. The university name in Chinese characters is in 4 characters. (Without the tone marks, the pinyin version is bei jing da xue. It sounds like bay jing da syuay. The characters in isolation mean north, capital, big, school.) The curved characters in the red circle are actually the first and third characters in the university name, bei da, giving the university the nickname Beida.



This is a satellite view of the Peking University campus, bounded by the major highways. The yellow line is a half kilometer long, for scale. The campus is located in the northwest part of Beijing in the Haidian District. Ring Route 4 crosses the lower part of the view. The white rectangle is a pedestrian overpass. Subway line 4 runs north under major northward street from there. The northwest part of the campus is dominated by park-like vegetation and ponds. My daily routines were mostly in the middle right part of this view, enlarged and noted in the next satellite view.

1. My apartment, shown below.
2. Pedestrian overpass.
3. Southeast entrance to campus.
4. My classroom building.
5. Student dining center.
6. Subway entrance.

I always walked between these locations.

1.

2. Pedestrian overpass.

view to south

3. Campus gate under trees. view to north

4. Classroom building.

5. part of student dining center

Walking path in northwest campus

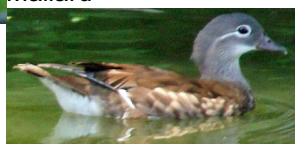
ERRC staff, most of us teachers, at lake

Chinese Blackbird

Chinese Pond-Heron

Mallard

Campus wildlife



female Mandarin Duck

My science course was offered by the university's Foreign Language School, to be taught in English. I had three months to design the course based on minimal information: the course title and this description:

Selected Readings on Frontiers of Science and Technology

This course aims at developing the students' reading skills with articles on frontiers of science and technology. The materials are selected from science journals, general and business newspapers and magazines, technical reports and Internet blogs, covering topics such as Artificial Intelligence (AI) (including deep learning, driverless cars and natural language processing (NLP)), big data, cloud computing and Internet security, Virtual Reality (VR) and Augmented Reality (AR), intelligent manufacturing (including 3D printing), medicine (including gene therapy and stem cell therapy), neuroscience (brain and behavior), the environment and green energy, climate, rocket launching and mankind colonizing Mars.

Students are expected to be able to read journal articles on science and technology smoothly and keep abreast of the latest advances in science and technology after a semester's learning. Moreover, they will develop critical thinking skills by analyzing and comparing materials of different sources on the impacts of science and technology on human life both individually and in discussions.

So from the title, the course must involve readings about the latest developments of science and technology.

From the first paragraph, the literature sources should span a large range from technical to summary. The topics should span a large range, certainly beyond anyone's own specialties. However, it is good to be exposed to a broad range of different scientific fields of study. That may include topics that may not be of particular interest.

From the second paragraph, the course should involve reading original journal articles recently published. It should give exposure to alternate observations and interpretations and applications, thereby developing critical thinking skills. The course should involve presentations leading to discussions.

During my career as a scientist I have been to many specialized conferences. Occasionally I have heard a Chinese scientist give an official presentation of their research findings. Some of them may have done excellent research, but their oral presentation was ruined by a poor delivery in the English language, in pronunciation, word use, sentence structure, and/or speaking volume because of shyness or stage fright. Prior practice would have helped.

In my previous 7 Summers of teaching English in China under the - - - (name withheld) - - - Program we taught classroom methodologies to increase practice and usage of English. Traditionally, Chinese schools have taught English from early school grades, but with the goal of excellent scores on standard tests, especially the Gaokao exam for university entrance. So students were excellent in reading English and in English grammar. But they tended to be poor in personal usage of the language. One of the - - - methodologies was to increase practice of speaking in English by dividing up the entire classroom into clusters of two, three, or four people. The room became noisy with all clusters talking simultaneously within their groups, but they were getting much more class time actually speaking in English. School headmasters tended to be resistant to such changes in teaching methodologies.

The course was to last for 4 weeks of July, being presented Monday through Thursday. I would have two classes lasting 2 hours each, one from 8 to 10 AM and the other from 10 AM to Noon. There would be up to 30 students in a classroom. During July I found that I had 28 students in one class and 30 in the other.

Preparation: I collected 534 science-related reports. I scanned at 200 dpi every article in the Science News magazine over 7 months prior to the class, cropping each page if needed to isolate the articles. I scanned newspaper articles from the Denver Post for the previous three months. I scanned articles from several other journals. I also made thumbnail icons of each article page for use in HTML listings and links to the many articles. All of the Science News articles and some from other sources referred to an original journal publication. There were about 200 different journals including a few scientific conference proceedings. Initially I wondered how many of those journals were accessible by Internet from China, but a first homework assignment proved access to nearly all of them.

Student Readings: The great range of topics was divided among the 15 days of homework assignments. Eventually an acceptable student workload was found. Each day each student was to skim through the dozens of Science News (and other sources) topics for the day and select an interesting one that referred to an original journal article. Then the original article was to be read via the Internet (or university library). As proof, the student needed to supply that article's journal name, article title, and author names for daily reports to the instructor. In addition, the article abstract was also needed for weekly summaries of the articles read.

Student Presentations: Using the article read for daily homework, each student was to prepare an 8-minute (usually PowerPoint) presentation to be delivered during the classroom period. This was to simulate a scientific conference in which a person is asked to speak for 8 minutes about research done by authors who could not attend the conference. The students would usually copy the important illustrations from the original article for use in their PowerPoint presentations. This exercise would give the students practice in summarizing in 8 minutes the important details of research presented in usually long journal articles.

Classroom Layout: Traditional classrooms have the student seats and desks (or tables) facing the front of the room where the instructor (or invited student) presents information to the class. For this course the seating was completely rearranged (causing concern to the building custodians). Excess seats and tables were stacked in the rear of the room. 8 tables were isolated in the remaining space, with their long axis pointing to the front of the room. Each table had 4 seats facing each other, 2 seats on each side of a table. (See photos at the end.)

Classroom Schedule: After any greeting and announcements, the instructor (myself) would usually present a topic to the entire class, taking up to a half hour. Then there would be two 40-minute sessions in which the students would give their 8-minute presentations. At each table one student would speak to the other three. Laptop or other displays would be at one end of the table for all four students to see. Within each group of four students, they could hear each other and ignore the speaking happening at other tables in the room. There would be 2 minutes after each 8-minute presentation for questions, answers, and preparation by the next speaker. For the next session(s) the students would be counted off by 7s or 8s and then move to the table of that number. That way each student would again give their presentation, but to a different audience.

Two times there was only one speaking session because the instructor took the bulk of the classroom time. On a few other occasions the entire 2-hour class time was used for 3 40-minute sessions; the instructor did not do a presentation that day.

Instructor Roles: On most days the instructor made a presentation. The first day it was to introduce the course structure, to give an example of preparing for and giving an 8-minute presentation, and then to give a brief history of the development of modern science. The second day the first topic was about the structure of scientific journal articles. The second topic was about the 7 Earth-sized planets discovered around a small red star. There was a great contrast between what was in the original journal article and what was released to the public. It showed the importance of reading the original version. After that the instructor's topics were varied. Some presented minority opinions in the spirit of promoting critical thinking, as required in the course description.

During the student's 8-minute presentations, the instructor was mostly a clock-watcher. I announced the start of each 8-minute session, gave a 1-minute warning as the end was near, and then the stop time. The students were to stop when told to do so. They were not to keep talking to finish their prepared presentation. (I pointed out that at real conferences, it was bad manners to continue talking in excess because it messed up the conference schedule or robbed the audience of a question and answer period. It was rare that a talkative speaker had to be removed from the platform, at great embarrassment.) During the presentations I walked around the room eavesdropping on the speakers to see what topics interested them and to make mental notes about the quality of their English speaking. Occasionally I had to quietly scold students who were not paying attention to the speaker, being distracted by text conversations on their smartphones.

Daily Evaluations: Eventually 5-point scales were created by which each speaker would be evaluated by the others at the table.

Points for each of the daily presentations, A. content:
5 - well prepared, and presented in 6 to 8 minutes; shows good knowledge of original article.
4 - adequate presentation and knowledge of original article, in 6 to 8 minutes.
3 - used original, or long Science News or similar article, but not well organized, and lasts at least 6 minutes.
2 - used short (2 or 3 pages) of Science News or other supplied article, lasting at least 4 minutes.
1 - any presentation lasting less than 4 minutes.
0 - did not prepare a presentation.

Points for each of the daily presentations, B. delivery:
5 - well-spoken free-form delivery in understandable English. (moderate Chinese accent acceptable).
4 - good English with some long readings from the display.
3 - good English, but must read from a prepared script.

2 - somewhat broken English, or too quiet and lack of confidence.
1 - about half or less understandable words and sentences.
0 - did not prepare a presentation.
After each presentation, the others at the table were to list the speaker's name, the original article's journal, title, and authors, followed by the pair of evaluation numbers. The lists for all presentations of the day were to be submitted by every student to the instructor for grade recording.

Some students made little or no attempt at seriously grading speakers by these criteria. That usually showed laziness or a lack of discerning ability, both negative factors. So eventually a method was created to negatively affect the final course grade if such was the pattern shown by the student. Grading quality improved when the students went to different tables. Initially they may tend to sit with friends and give them all excellent grading scores. Mixing the participants at a table exposes everyone to a greater range of study and speaking abilities.

Grading: The university wanted a numerical grade for each student, with the class median near 85 and some other specifications. Normally that would be made up of final exam results plus some other criteria. But I do not give quizzes or exams. I give a grade based on performance, which is closer to what is encountered in employment. All students at Peking University are there because they had excellent scores on the Gaokao exam. They are excellent test takers. However, some of them in this class were lackadaisical, taking the importance of the exercises and presentations by others too lightly, or failing to turn in evaluations or weekly summaries at appropriate times. So I used the averages of the 8-minute evaluations for 60 percent of their final grade. The rest of the final grade was mostly determined by whether they turned in the daily or weekly reports. There was a minor adjustment based on their discernment quality of the other speakers. Such a performance-based grading system was a surprise to some students who otherwise relied on final exams to make up for deficiencies during the classroom sessions.

Contrasts: This course had a very non-traditional style, both in classroom layout and educational structures.
- Traditionally, there is only one speaker at a time during a 2-hour class. I had 7 or 8 simultaneous speakers.
- Traditionally, in a 2-hour class of 30 students, the average time that any student gets to practice speaking in English is only a few minutes. For my class style with 2 reporting sessions, every student in the room gets 16 minutes of practice speaking English.
- Traditionally, the degree of learning by the students is limited by the knowledge of the instructor. In this course, in every 8-minute presentation, the knowledge that was passed to other students at a table greatly exceeded the knowledge of the instructor. The students had read the original journal article, while the instructor had only read the Science News summary or other source.
- Traditionally, speaking in a foreign language before a large audience can be threatening and carrying a risk of embarrassment. Speaking to only 3 others who are also students is a safer environment where mistakes can be overlooked and confidence can be built up. With such repeated practice, stage fright can be reduced.

Comments: The university did not request that students evaluate their Summer instructor (as they do for the rest of the year), so I was disappointed. Even so, 17 of the 58 students sent me comments by email, exactly quoted.
- In this class, I spent lots of time reading papers and practicing speaking them everyday. So, I believe that I've improved my English ability of academic presentation this month. Thanks for your teaching!
- Thanks for your teaching. I really benefited a lot from this course, especially that my spoken English improved greatly.
- Really had a good time taking this class. Well, I think that it maybe better if you encourage(or force) students to change their groups everyday to talk to different people. All in all, thanks for your specially-designed course, wish you a nice flight home!
- And thanks for teaching us this four weeks! I am gradually enjoying reading scientific materials due to this course, though I at once felt tired for this kind of workload. In my opinion, it would be better if you told us some critical rules and helpful skills on reading and presenting scientific paper at the beginning of this course.
- I am not good at speeking English, so I'm sorry I didn't give the feedback directly face to face. I think the course design is quite good. It is new and fresh to me, and I'm forced to practice speaking English every day, which is very helpful. Besides, I made some new friends in this class by presenting and listening.

But I think there is still a problem for this course. The student can't get feedbacks. It's hard for us to know our mistakes, espacially the listeners are strangers in most occasions.
What's worse, because the listeners are usually not familiar with the topic, not only the speaker makes mistakes himself, but also he spreads the wrong information to the listeners. In fact, I found several mistakes on chemistry and pronunciation in the presentations made by other students.
But all in all, this course is very good, and thanks for your teaching!
- Thank you for these 4 weeks' teaching! This mode of class does help me gain much experience(either by trialing or by learing from others) and improve my presentation skills(I'm afraid of doing public speaking before).
- Thank you for all the class activities during the 1-month class. I did learn a lot in this class. Wish you have a pleasant day!
- Thanks for giving us such an impressive class!
- Thank you for giving us all these wonderful classes this Summer. And 4 days later: - Thank you for acknowledging my performance. And I'm delighted that I had a wonderful experience as well as a high grade this Summer in your class. Thank you again for the special and interesting classes. Best wishes!
- Here, I would like to express the most sincere appreciation for giving us such a fantastic lesson! Provided with the most fascinating materials covering so many topics of science, I practiced and improved my reading and presentation in this July. Moreover, I got approach to the wider world of science and nature, besides the major(Computer Science) I used to be buried in. I have subscribed Science News for a year.
To be honest, I was amazed in our first class, hearing that your are 72 this year. Wish you longevity and good health, and enjoy your time in China!
- Thank you for your devotions and these days' lessons. Although being faced with some challenges, I appreciate this novel class.
- Thanks for your teaching. It's a really useful lesson, and did broaden my horizon.
- Thank you for all the time and energy that you put in this course! Your energy left me a deep impression! Wish you a great summer vocation and good health!
- My spoken English is not good. Thanks for the course. It gives me the courage to speak in front of others. Thank you, Dr. Ed.
- First of all, really appreciate you efforts and hard working! The first time I saw you then I make a completely blind guess that you must be a very old-school guy and may not be young and competent enough to be a good teacher. Gradually I think it's a little bit of 'brutal' for us to read the original paper detailedly then prepare a nice 8-minutes presentation (sometime we need spend lots of time to read and what make it harder for us is actually we are in the summer vacation, so we desperately want to back home). However at the end of the last class when I looked back everything and moment we have, I think all efforts are worthwhile and the most thing I cherish is the time we spend together. In fact, the nearer we close to the end of the class the more we cherish it. I really appreciate everything you did for us and the moments we have together!!
- And thank you to accompany us through the past meaningful and joyful month. (^_^) In this month,I did practice much for my spoken English(more than other English classes). Though I still need more improvements to make a better presentation,you have led me to a good start and I'm really grateful for that.

And finally, there was an immediate benefit for one student:

- I would like to express my appreciation for your course first. I was invited to give 2 1-hour talks on numerical linear algebra on week 4 day 2 & 3. This course really helps me deliver the 2 presentations. I was not nervous at all even I had to make such a long presentation with English, for I have already done similar short presentations about fifteen times these days. And the course tells me the difference between a presentation in a conference and a weekly report to the mentor. Just don't include too many details in the presentation, otherwise the listeners may fail to follow and they would be bored. Tell the listeners the intuition and insight of your work so that they can catch the key point.
Then the reading materials are good for they covers many topics. I am unfamiliar with most fields and that makes me works a lot these days. But this is very similar to the situation when the researchers begins the study of a new field. The ability to get knowledge about several topics in a short time is important to researchers and I need such training.

My course had a non-traditional style, but it seemed to work well with many benefits for the students. I have presented all of these details so that perhaps some other teachers might design similar course styles.

Dr. Ed Holroyd
26 August 2017