

## Artistic or Scientific

A comparison of teaching methods in China and the US from the perspective of an overseas student

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**Abstract-**This paper provides a brief comparative review of the university classroom experience in the People's Republic of China and the United States with a particular emphasis on the way in which the Chinese university classroom experience differs from that of the United States. The review draws to a large degree upon writer's personal experience in both American and Chinese university classrooms. The paper is divided into three sections, the first of which focuses upon the liberal arts classroom experience with the second section focusing upon science and technology classroom experience. The final section offers several recommendations for making the classroom experience in Chinese universities more attractive to American University students.

**Keywords:** college course; oversea education; classroom experience; Sino-US comparison

### I. INTRODUCTION

The higher education system in the United States has its foundations in the Western humanistic and liberal approach to education which, in keeping with the Classical models upon which it was based, has traditionally placed the teaching of rhetoric and the art of persuasion at its core[1]. Although the modern system of higher education in the United States has digressed considerably from this model over the years and no longer places the classical emphasis on rhetoric at the centre, the effects of this traditional emphasis can still be felt in many throughout much of the educational experience in American universities [2]. The most prominent legacy of this now mostly superseded traditional approach to education can be seen in the classroom behaviour of the students themselves and the expectations placed upon them are the teachers.

When compared to the Chinese classroom experience, American classroom is a much more lively place where students are expected to be - and indeed are - an active participant in the teaching process [3]. Another legacy of the traditional Western educational approach with its emphasis on learning how to formulate well founded and persuasive arguments is the relative creativity of American students when compared to students in China. Not only is such an environment promoted by the teachers, it has also come to be expected by a good proportion the students themselves and

as a result academic programs which fail to provide such an environment will ultimately meet with the disapprobation of a large proportion of the students themselves [4].

The education system in the People's Republic of China has its roots in the Ke-ju centric educational system which began to take shape in the Song Dynasty as a result of central government's policy of selecting the vast majority of its civil servants from amongst a pool of candidates who performed well in a series of standardized examinations formulated and administered from the center (the 'Ke-ju') [5]. The content of these examinations tended to be quite limited in scope (mainly restricted to the Confucian Classics) and were designed in part with the intention of maintaining a certain level of ideological control over the nation's educational system by using the examinations themselves as the vehicle for propagating the approved state ideology throughout the country's schools [6]. In short, these tests formed the core of a national curriculum and this policy, strengthened and re-enforced over the next thousand years had a massive impact on education in China at all levels and still be felt today not only in China, but indeed throughout much of the Sinosphere[7].

Since the beginning of the 'Reform and Opening Period', the Chinese party and state have introduced and implemented wide-ranging education reforms with the stated aim of creating an education system which could 'bring up a large scale of advanced talents and experts for the construction of socialist modernization' [5]. Nevertheless the Chinese education system continues to adhere closely to its historic literary and test-centered approach and as such its strengths still lie in the teaching of the liberal arts related subjects whilst its limitations come to the fore in the more scientific and research oriented fields.

### II. THE LIBERAL ARTS CLASSROOM

As noted above, the Chinese education system is at its best in the teaching of literature and the liberal arts and the writer's own experience in the Chinese academy seemed to confirm this. In 2014, as part of my continuing study of the Chinese language, one author enrolled in a third year Chinese language program at Nanjing Normal University which included, among others, a Modern Chinese literature

course and an introductory course of Classical Chinese and it is these two courses which are to be the focus of this review. The writer quickly came to the realization that the teachers assigned to teach these courses tended to be far more knowledgeable in the subject matter than as is usually the case in language and literature courses taught in American universities and their superiority of knowledge is particularly conspicuous in their mastery of traditional language, literature and culture.

One thing that stood out in particular was the fact that, unlike English teachers and indeed even most professors of English in the United States - the language and literature teachers at Nanjing Normal University were well-versed in traditional literature and familiar with the historical context under which the literature was originally produced. They were also skilled at the techniques of literary analysis and were able to teach it to their students -including myself - in a thorough and systematic manner of the sort no long commonly seen in American universities. Unlike literature professors and teachers in the United States who long ago lost their ability to understand the classical languages of the West (that is to say, Latin, Greek and Hebrew) and are in many cases perfectly ignorant of these languages and the classical western literature which sprang therefrom, the teachers here are generally capable of understanding Classical Chinese - which as the classical language of the east plays a role within Eastern culture that is not unlike the role played by Latin and Greek within traditional Western culture.

This was, we should add, a pleasant surprise for foreigners who had grown used to the idea of being inflicted with a liberal arts education by those whose own grasp on the liberal arts - and culture for that matter - was itself a bit shaky and lacking in depth. Another pleasant surprise was the fact that these courses were free of any sort of frivolous ideology. It is a happy irony for me to note that it was only in the Chinese Mainland and within the confines of a university administered by a Communist Party that the author was finally able to come upon a college-level literature course in which the professor did not spend his time focusing on teaching his students the 'Marxist literary analysis' of the literature being discussed or otherwise in framing every piece of literature in terms of the struggle between the exploiters and the oppressed.

Indeed, one of these courses which the author attended as part of the program - the course on Modern Chinese literature - was without a doubt the best and most useful literature course that the author have ever taken (so much too that the author in fact re-enrolled in the same course the next year it was given for the sake of re-enforcing what the author had learned the first time around - the first time the author have done this in the case of literature course). The result are literature courses which are rigorous and notably free of the sort of ideological frivolities which have come to adorn English literature courses in American universities, which are taught by teachers who know their stuff. They instill

within Chinese students - as well as the few Westerners who enroll in such courses - an appreciation of culture, its historical roots and its continuing relevance in modern society which provides the students with a sound foundation for continuing their studies whether it be in the arts or whether it be in the sciences and it is this strong cultural foundation - and the discipline it instills within the students - which plays a crucial role in enabling Chinese students to be competitive with and at times outperform their American peers in many American universities despite their deficiencies in the English language (at least when compared to their American peers) and the cultural differences which they confront.

### III. THE STEM CLASSROOM

While Chinese universities show their strengths in the teaching of the liberal arts and indeed offer a liberal arts education which is in many respects superior to that found in American universities, the science and technology instruction in Chinese universities, whilst steadily improving, nevertheless lag behind that offered by American universities. In 2016, one of the author enrolled in a Software Engineering master's degree program at the Nanjing University of Science and Technology (NJUST). The language of instruction of most of the courses of the program is Chinese. However a few courses are taught in English, including a course on Formal Semantics. In this paper, we will focus on the Formal Semantics course as well as the Machine Learning course, which one of the authors took concurrently with the Formal Semantics course and which was taught in Chinese.

The thing that stood out to me the most when taking both courses was the lack of relative dearth of practical content offered. Although this is quite understandable in the case of the Formal Semantics course as the subject-matter of this course, with its focus of proving the logical correctness of programs rather than actually creating programs, is highly theoretical in nature. However, the machine learning course offered a great many opportunities for the students to apply the knowledge they were learning in practical programming tasks. Practical content however was limited to a single homework assignment over the ten-week period of the course. While this is of course a good start, it would have been nice to have been offered more practical learning opportunities, such as additional homework assignments and perhaps even a group project which could have been completed over the period of the course.

In the Formal Semantics course, which was to be taught in English and had a rather large contingent of foreign students, foreign students could not help but notice that as the course continued the amount of Chinese spoken in the class (between the teacher, a native Chinese speaker, and some of the students, who are also native Chinese speakers) continued to increase. By the time the course had ended, it was reaching the point the course was well on its way to becoming a 'half-English, half-Chinese' course, which we

don't believe was the intention at the outset. This is not the first time foreign students in China have seen such an effect. Whenever there is a group of people who speak a shared native language but who are in an environment where that requires them to speak a second language, there is always the tendency for members of that group to slip into their native tongue when communicating with each other without even being aware of it.

All in all, both courses were taught in a manner which could be described as 'traditional'. They both used a style which closely conformed to manner in which liberal arts course are taught, with a heavy emphasis teacher centered instruction methods and less interaction with the students. The machine learning course in particular placed heavy emphasis on the rote memorization of course content of the sort which is not usually encountered in American STEM courses, which tend to focus more on applying the knowledge in the course of practical problem solving rather than merely remembering it by heart. While this approach is generally effective in the teaching of the liberal arts, there are limitations when it is applied to the sciences. If US universities can be said, at times, to have a problem with trying to apply the methods used for teaching STEM courses to the liberal arts, then it should also be noted that Chinese universities have an unfortunate tendency to apply teaching methods best suited for the liberal arts to the teaching of STEM courses.

#### IV. PREPARE YOUR PAPER BEFORE STYLING

Firstly, it must be pointed out that the attractiveness of a nation's university STEM programs will continue to be dependent on that nation's reputation in the STEM fields and as a center for STEM related research and development. China does not yet have a reputation as a leader in STEM related research and development. This is the main factor inhibiting the attractiveness of China's university level science and technology programs. For those reason universities in countries like the US and the UK, which have strong reputations in the STEM fields, will continue to be more attractive destinations for those seeking a university education in STEM fields for the foreseeable. That being said, there are certain steps that Chinese universities ought to consider in order to create an environment more suitable for foreign - particularly Western - STEM students.

Firstly, teachers of courses for foreign students should consider increasing the amount of practical content in the course. Compared to most STEM courses offered in Chinese universities which focus almost entirely upon theoretical content, American STEM courses tend to put more emphasis on application. For example, American CS courses generally include class projects where the students are expected to apply the knowledge they have learned in practical software development tasks. Such an emphasis on applying the theoretical material learned in the course helps to reinforce the material learned in the seminars whilst at the same time

fostering the students' creativity and helping them to develop practical problem solving skills.

Secondly, the course schedules and grading requirements should be laid out more clearly in the course syllabi. Compared to Chinese university courses (at least at the graduate level), American university courses tend to be much more orderly affairs and American students have grown used to this and indeed expect this in their courses. Lack of clarity in course schedules and course requirements can cause a great deal of discomfiture on the part of the students and can negatively impact their scholastic performance.

Thirdly, teachers should take positive measures to foster interaction between Chinese and foreign classmates. Not only does this help the Chinese students in the class by providing them with an opportunity to interact with foreign students and to improve their English skills as well, it also can help to put American students at ease and make them feel more comfortable. Americans tend to be sensitive to perceived ostracization by classmates and this is obvious when they find themselves in the minority. Positive measures could include the teacher playing a more active role in group formation to ensure balanced groups (rather than Chinese only & foreign only groups), arranged seating during certain class activities - much as laboratory activities, etc.

Along similar lines, when teaching courses whose language of instruction is English, teachers should also try their best to refrain from using their native language in the classroom when teaching, even if it is just to make something spoken in English clearer to Chinese students. There seems to be a tendency that when the teacher, who is a native Chinese speaker, and the students who are also native Chinese speakers, begin using Chinese in the classroom, a sort of snowball effect forms wherein begin to increase the usage of Chinese and decrease the use of English without even being aware of the fact that they are doing so. If care is not taken to avoid this, then what was supposed to be a course taught in English can, easily and without any actual intent on the part of anyone, turn into a half-Chinese half-English course which ends up imposing difficulties on foreign students who can't speak Chinese.

With the rapid development of Chinese economic globalization and strength in politics, much more students will choose Chinese universities for colleges and graduate education. Chinese educators should adopt not only latest STEM techniques and knowledge but teaching methodologies/pedagogy [7].

#### REFERENCES

- [1] Conley, Thomas. *Rhetoric in the European Tradition*. University of Chicago, Chicago, USA, 1991.
- [2] Kernan, Alvin, ed. *What Happened to the Humanities?*, Princeton University Press, Princeton, New Jersey, USA, 1997.
- [3] Pfister, Allan O. The Role of the Liberal Arts College: A Historical View of the Debates. *The Journal of Higher Education*. Ohio State University Press 55(2): 145-170, 1984.
- [4] Feng Xiuxia. On American and Chinese Higher Education. *Asian Social Science*, 2008, 4:6.

- [5] Busk, Tony, Qiang Haiyan. Leadership and Culture in Chinese Education. *Asia Pacific Journal of Education*, 2013, 20:2, 58-67.
- [6] Ren Lida, Xue Xihong. *The History of Official Election in Ancient China*, Qingdao Publisher, 2003.
- [7] Fogel, Joshua A. The Sinic World, in Ainslie Thomas, Gluck, Carol, *Asia in Western and World History: A Guide for Teaching*, M.E. Sharpe, 1997, 683-689.