

## Building creative ability in Cambridge culture

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**Abstract:** As a most famous university in the world, Cambridge University is unique in education. She always emphasizes rational training and personality shaping in teaching process, pays attention to the inventive research, and rejects utilitarianism in education. Cultural syncretism and idealistic communication are also common and very active in Cambridge. There are three points that we learn from the Cambridge mode: at first, encourage inventive research, attach importance to accumulation; secondly, give students an unrestricted, free study atmosphere to study or research on their own initiative; thirdly, pay more attention to the communication between teachers and students, or among students, regarding the ways of communication, not only about the content.

**Keywords:** creative ability; inventive research; utilitarianism; cultural syncretism; idealistic communication

### INTRODUCTION

University of Cambridge, founded in 1209, is an oldest and most famous university all over the world. During her nearly 800 years' history, there were more than 60 Nobel Prizes, a lot of important scientific discoveries obtained here, such as the model of atomic planet, electron, the molecular configuration of DNA, and so on. There have been being a large number of politicians, economists and scientists grow up at the bank of River Cam. Why? Why a bank of a small river can breed so many talent people in all kinds of fields? That is what we are working on by analyzing the academic spirit and educational pattern of Cambridge in this article.

### MAIN SECTION

As an oldest university in the UK, Cambridge University richly expresses her great unique charm in operation idea, education ways, academic atmosphere and also the campus environment.

The free educating theory dating from long ago insists on rational training and personality building, means that obtaining knowledge and developing intelligence is the unique objective of education, while advocating inventive research, encouraging well-grounded accumulating, and opposing educational utilitarian. Different from the U. S. and European Continent, the basic principle of free education theory has been reserved from long ago, as exotic

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thoughts has come in or been absorbed rarely. 'It nearly occupies the controlling position in the British educational theory field, while the educational practice is also influenced by the free educating theory.'<sup>[1]</sup> This notion is presented in every aspects of educational practice. In the objective aspect, emphasizing the development of intelligence more than acquiring knowledge; in courses and specialties' setting, paying great attention to the inhesion and the self-value of knowledge, especially to the academic subjects, rather than aiming utilitarian benefits; in the content aspect, the select criteria of teaching material is for erudite other than specializing. During the teaching process, individual and inventive thinking, active opposition and animadvert are encouraged adequately. Thus focusing on academic research and how to bring into fully plays the potential of the students have become a custom of Cambridge from long ago. Sir William John Hughes Butterfield, who was Vice Chancellor of Cambridge, said that we need to be watchful of the independence of the academic that is the headspring of a university, protect our academic research or research attitude from any disturbance caused by the relationship with industry and commerce. It is the academic freedom that has been cultivating students well-fundament and all-around, especially creative.

The cultivation in Cambridge works not only on the 'listen', 'read' and 'remember', but also on the 'argue', 'write' aspects. 'Argue' is about the expressing and corresponsive abilities, including training the ability of synthesizing and logical analyzing. Seminar is a typical traditional way of this. It is always held in a small group with no more than 20 people, in which students are encouraged to join discussion and share ideas. Different from usual class, even every student needs to attend the discussion on their own initiative, other than absorbing teachers' instruction passively. The most importance of this kind of teaching way is that students would do a lot of reading, thinking, in-

formation collection and syllabus writing in advance in order to take part in the class talking. Some professors also make notes of the discussion and put up on the website for students to comprehend and review better. Students always profit greatly from this educational manner, especially in developing their oral ability of delivering opinions.

'Write' is the first way of expression. Essay writing is another important training for this aspect's training, besides the seminar syllabus' preparation. Essay and dissertation's writing has become an important component of teaching. Normally teachers give certain different types essays' homework to students for training. For example, in Department of Architecture, students are required to complete sixteen essays including dissertation' writing during undergraduate years. For the freshmen, they need to finish six essays, covering the history of architecture, the thinking of architectural practice, the architectural theory, the structure design principle and the fundamental of environment design. For the second year, there are five essays for them, interested in the history, urbanization principle, structural design, environmental design and so on. During the last year, students will do further research on architecture and urbanization from academic and historic angles, together with investigating in the tectonics, timbering, architectural techniques and other special field.<sup>[2]</sup> Thus students would improve a lot not only in professional knowledge, but also in expressing and analyzing ability, by doing these various essays in both practical and academic sides. So far as I know, this way of training is very popular in most departments of Cambridge, as its own traditional educating mode.

Active cultural syncretism and idealistic communication are typical in Cambridge. Tea break is a tradition there. Professors and students usually talk about scientific research or daily life with each other in this comfortable minute, having biscuit and coffee. This small sweet casual talk oftentimes brings fantas-

tic surprise or brainstorm, even ideas leading significant scientific discoveries. As a former vice chancellor, Sir Alec Broers said, we have got more than sixty scientists awarded in Nobel by drinking coffee. There is a widely known story about Professor Frederick Sanger, who won the 1958 Nobel Prize for determining the order of amino acids in the insulin molecule and shared a 1980 Nobel Prize for developing methods for mapping the structure and function of DNA. One autumn afternoon, Professor Sanger was contemplating in the structure of amino acids and could not bring any solution or progress, while some others spouting around. The plant out of window on the opposite wall attracted Professor Sanger suddenly. He said with a sigh, how should the structure of amino acids be? Does it grow like the ivy in one direction? Some professors joined in, such as Peter from Physics department and Jones from Chemistry department. So did an old professor from Biology department. Then more and more people in the coffee room took part in this discussion base on their own different special knowledge. Professor Sanger analyzed carefully on the same evening with inspiration coming from that special seminar and finally found a clear idea for following research which leading the determination of base sequences in nucleic acids successfully. That earned Professor Sanger the 1980's Nobel Prize in Chemistry.<sup>[3]</sup>

The relax environment is also very common between teachers and students. Maybe with coffee, maybe with music, teachers and students communicate with each other about their academic opinion and thoughts. In the history of Cambridge, several pubs are popular for such meeting between teachers and students, such as the small pub at Grandchester. There, pictures of Russell, Keynes, Wittgenstein are hung on the wall, as they used to talk and bring brainstorm together in the comfortable garden with apple trees and several benches.

Dr. Joseph Needham said that, maybe you are a

British young man studying English literature, next door to the Irish who is doing biochemistry, while sharing house with a Nigerian student in law and a Scottish student in theology. It indeed highly enlarges people's views by talking together and exchanging ideas.

Actually, tea break and coffee time offers an opportunity for free communication among people from different research fields, different backgrounds, different political parties, different countries and different religions, which has given birth to a lot of important ideas changed the world. So did Newton, Darwin, Bacon, Russell ..... some ordinary students at Cambridge in the past. Maybe the spark of genius of theirs just came from this kind of informal meetings. As the president of University of Cambridge, Lord Alec Nigel Broers said, in the unique atmosphere at Cambridge, sufficient idea exchanges enlarge our views fully and make us facing both challenges and chances, which obviously have bought us inspiration and energy.

During recently years, Cambridge University has been trying cooperation together with MIT. It comes in kinds of ways. Scholars exchange to share latest scientific ideas and do research with each other, while students do the exchange visits as well. Some students have opportunities to study in a different environment and feel different academic tradition and mode. This direct kind of communication and compensation are good for enrich students' views and knowledge. Furthermore, Long-distance education by video can bring the students sitting in the two best universities to the very same class to argue, discuss, and progress seminar. It is really fantastic and often brings unexpected effects.

The above-mentioned education concept and the training pattern, which is far more different from that in our country, could be used for reference of our universities.

First, we should pay more attention to original

research. At present, people who do scientific research are so eager for success in common, both in graduate education and in application of scientific task. Basic research is ignored and scholars are pursuing the results that can be easily got such as the number of essays. However, nearly all the important processes in science are based on original research. There is no shortcut.

Since the 1980s, it has been an exciting situation that scientific researches in our universities are developing vigorously. But going along with the China's modern innovating and opening, it has shaped a situation that our universities could only pay their attentions merely on applied skills of specialty by the force from the pressure of market economy which is weighed by some various quantity targets and economy profit. The establishment of market economy system made people stress on the social-service function of universities and trend to ignore another function of science & academy for the un-rational consideration of the market economy. As a result, there is often a utilitarian guidance in our governments who are always willing to imbrue items of practical benefit, a utilitarian guidance in our universities who are always willing to build faculties of so-called popularity while completely disregarding self-tradition and intrinsic disciplinarian of science, and a utilitarian guidance in our students' mind that force them to sign up the more-practical, easier to earn and obtain subjects rather than foundational subjects. The utilitarian attitude to education and science not only leads to some foam phenomenon such as an universities inclination to engineering, a degradation of momentous foundational research, a weakening of scientific personnel & potencies storage, but also a declination of the scientific research level. What is worse is that it erodes the spirits and characters, which formerly belongs uniquely for our universities.

The research of innovation is a root of a university. China is of a history of centuries old, as well as

many proud productions of science and technology, whereas under the Feudatories Autarchy, which wanted to dominate people's mentality with Confucianism and omitted the foundational scientific research, our developing of science was inevitably trailed. In the Song Destiny, there were ever Mathematics, Medical, Astronomy in the schools, but the solely existed natural scientific subjects were abolished by the time of Ming & Qing Destiny, replacing by the liberal arts such Confucius's canon, Zhuxi's theory, etc. A famous scientist called XU Guangqin had pointed that natural science has been abandoned in the atmosphere filled with theologians.<sup>[4]</sup> Differing from the feudatory's society of China, the Europe attached great importance on the education of natural science since the Middle Ages. As early as the 12th century, Italy had set up a famous medical university. In the middle ages, it prescribed that students must learn seven foundational subjects including mathematics, geometry, and astronomy to sign up for their future specialties.<sup>[5]</sup> Furthermore, the content of education was increasing, in the time of renaissance, it had added up with subject of naturalness, such as geography, physics. By the time of 17th and 18th century, those subjects were gradually forming the knowledge of mathematics, trigonometry, geometry, botany, zoology, mechanics, chemistry, physics, and astronomy, e.g., which laid a solid foundation for the modern science. And due to the incessant development of foundational science and on the precondition of high regards of research of innovation, there came into being an amount of great scientists such as Copernicus, Galileo, Kepler, Harvey, etc., who contemporarily impelled developing science greatly.

The University of Cambridge has gained compelling achievements in a long period of time, which is just on the result of her solid foundational research. The fact has proved that there is no ways to make a positive achievement for science other than abandon oneself to the quantity of publishing and throwing

over the fickleness. The only genuine way is to do the foundational research sure-footedly to go to the final great success, after a long-time accumulation.

The second is on the education conception, it is necessary to mobilize students' initiative, to bring up students' interest, to introduce students to research probe. From long till now, students are accustomed to accept knowledge passively, under the educate-for-exam system, students' motivity of study due to the pressure of examination, rather than their study interest, while teachers are trend to infuse rather than a consideration of students' interest, resulting some teachers could only maintain their courses by roll call, which made an quite adverse effect on the teaching of courses and exerting of students' wisdom, even a cutting out of students' desire to learn. To shift this situation, turning students' studying form passiveness to initiative, it is necessary to give students more space, to induct them to think, to ask, to consider, to motivate subjectivity both timely and formally. Students can be encouraged to declare themselves more through the way of seminar. Accordingly, their abilities of thinking, judging, analyzing and expressing can be well trained. More than a machine of examination, these typically trained students can be provided with a much stronger ability of independent working and dealing with issues.

The third, attaching importance on intercommunion of both teachers to teachers and teachers to students, and consequently a wider space and better chances. It is not only a formally issue but a gestation of inter transference of thought and impact of ideology, sparkle of inspiration and finding of science & technology. House properties for education is limited

all over our country: almost no rooms for everyday communication between teachers and students can be found in the school except teaching room and office. Accordingly offices become main places where students can find their teacher to ask. Notwithstanding, the fact that there is a quite a lot of teachers have no independence offices made most of the students' wish of communication abandoned. On the other hand, the solemn ambience lacking of easiness and coziness of teacher's office blocks off this communication on a certain extent.

Another block-off of communication of students to students represents in the design of teaching and lodging houses. No functional communication spaces can be found and chances of communication are virtually lost due to this irrationality. The everyday afternoon tea and coffee in Cambridge, seemingly an honor and a welfare for professors, provide a place and a quomodo for the intercommunication among professors. Coffee or tea is more than a need of relaxation and living fare, which has become an important bridge of people's intertransference of thought and impact of ideology.

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