Critical Thinking in Chinese Higher Education:
A Case Study of Knowledge Transfer

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Abstract

The issue of critical thinking (CT) amongst Chinese students has emerged as an important topic among educators. While there is some literature on CT and Chinese students' performance, no study has tackled how this increasing focus on CT is impacting on higher education in China and what CT means to policy makers, teachers and students. This thesis sets out to fill this gap using insights from the theory of knowledge transfer. This theoretical framework was chosen in order to examine the ways in which Western CT theory and practice is gradually being imported to and integrated into Chinese culture, largely focusing on the understanding of CT. Using a case study approach, the thesis reports on empirical findings that have emerged from analysing Chinese Ministry of Education press releases and mission statements, observing university CT classes and studying chats about CT on a student internet discussion forum. Findings show that: 1. some core aspects of modern Western approaches to CT, such as how to deal with uncertainty, are missing in Chinese teaching; 2. disposition and emotion are sidelined in favour of a strong focus on logic and reason, and their inseparable relationship to reasoning ability found by Western scholars was neglected. 3. CT is regarded as crucial by Chinese educators and students but currently the teaching fails to make CT accessible and interesting to students and might therefore not foster CT itself. These findings have important implications for how policy makers and educators might continue to implement and teach CT in China.

A list of published papers

Ruijing Li (2015) 'The dream in my heart', *Liberation Army Daily*, 21 March 2015. (Original title in Chinese: '我心中的梦', *解放军报*, 2015 年 3 月 21 日)

Ruijing Li, Wei Hao and Bing Li, (2013) 'Liberate minds through thinking dialectically', *Red Flag Magazine*, no. 14. (Original title in Chinese: '运用辩证思维解放思想', *红旗文稿*, 2013 年 第 14 期)

Wei Hao, Ruijing Li and Bing Li, (2013) 'How to understand behavioral finance and mathematical finance', *GuangMing Daily*, 2 August. 2013. (Original title in Chinese: '如何看待行为金融与数理金融', *光明日报* 理论版, 2013 年 8 月 2 日).

Wei Hao, Ruijing Li and Bing Li, (2013) 'The regional economy and inter-regional economy', *The Mayor's Reference*, 2013, no. 6. (Original name in Chinese: '区域经济与区域间经济', *市长参考*, 2013 年第 6 期).

Bing Li and Ruijing Li, (2011) 'Exploring effects of intellectual property in sustainable development from the perspective of cultural development', *A Collection of Ethnic Studies*, Series 2011, pp: 177-190. Beijing: The Minzu University of China Press. (Original title in Chinese: '从文化发展角度探讨可持续发展中知识产权的重要作用', *民族研究文集*, 2011 年辑, 第 177 至 190 页,中央民族大学出版社 ISBN: 978-7-5660-0100-9)

Bing Li and Ruijing Li, (2011) 'Exploring the importance of intellectual property in economic transition from the perspective of technological innovation', *A Collection of Ethnic Studies*, Series 2011, pp: 163-176. Beijing: The Minzu University of China Press. (Original title in Chinese: '从科技创新角度探讨经济转型中知识产权的重要作用' , *民族研究文集*, 2011 年辑, 第 163 至 176 页,中央民族大学出版社 ISBN: 978-75660-0100-9)

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List of Abbreviations

CT	Critical Thinking
HE	Higher Education
KT	Knowledge Transfer
MOE	Ministry of Education of the People's Republic of China
CCTDI	California Critical Thinking Disposition Inventory
CCTST	California Critical Thinking Skills Test
CPC	Communist Party of China

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Chapter 1 Introduction

1.1 The aim and rationale the thesis

Over the last six years (2011-2016), the national Critical Thinking (CT) teaching seminar (全国批判性思维教学研讨会) has been held annually to discuss progress regarding CT education in China. The main changes that have taken place are combining CT with various innovative teaching methods such as 'turning over classes', online courses, one-to-one teaching, supervising teaching, and model court debates (翻转课堂, 慕课, 一对一教学, 导师制, 模拟法庭辩论), and universities have been systematically reforming the structure of their curriculum (Qian, 2014; Li, and Zhang, 2015; Tsinghua, 2016) in order to integrate CT better. Reforming Chinese traditional teaching methods has so far been the main outcome of studies dealing with Chinese students' CT, as many discussions on cultivating Chinese students' CT confined themselves to testing how some teaching methods that are popular in Western universities can improve Chinese students' CT.

While some studies have begun to analyse CT in the context of the Chinese higher education (HE) system, scholars have so far neglected to examine what CT means to policy makers, teachers and students in China. Few studies have explored whether Chinese students and teachers have any difficulty in understanding CT, and if so, what these difficulties may be. Recent reforms, such as those mentioned above, indicate that Chinese policy makers want to imitate the success of Western universities by providing their students access to Western education styles. However, directly introducing CT classes and copying Western teaching methods indicates that Chinese educators and policy makers conceptualise adopting Western CT into China as a pipeline transferring process through which CT is transferred from West to East, overlooking however that CT may be taught and understood differently in Chinese context.

The aim of this thesis is to investigate how knowledge of CT is reinterpreted, understood differently and transformed in Chinese HE based

on a knowledge transfer (KT) perspective. As can be seen from the review above, theories of CT have been learnt about by Chinese policy makers, educators and students, and practices of CT have been adopted into Chinese classes through various educational reforms using theories and concepts derived from work on KT within organizational studies. If we take knowledge as the theoretical and practical understanding of a subject (Nagel, 2014), CT can be seen as a kind of knowledge that is being constructed in China. Learning about CT in the Chinese context can lead to a different knowledge of CT, compared to the knowledge constructed by Western CT scholars. Constructing a kind of knowledge in a different context is the core issue that is investigated by KT studies, which particularly emphasise that the process of KT must not be seen as just conveying knowledge from one place to another (Argote and Ingram, 2000).

The process of KT should not be taken as a 'copy and paste' process but as a process of reinterpreting knowledge contextually, which involves breaking down and recombining elements or aspects of the knowledge (Kogut and Zander, 1993). Many KT studies focus on the relationship between the 'context and content' of knowledge and found that when knowledge was transferred from one organisation to another, the parts of the content that are not consistent with its new context will not be adopted even if the knowledge appear to be appreciated as a whole (Argote and Ingram, 2000; Szulanski, 2000; Kogut and Zander, 1993). In other words, the content of the knowledge will be transformed in the process of transfer. Here the content refers to the synthesis of the elements associated to the knowledge. The term 'transfer' can actually be understood as a metaphorical expression. This 'transfer' does not means copying knowledge of another organisation but re-constructing it through learning and reinterpreting.

Chinese educators and policy makers have been importing some theories and practices of CT from the West and teaching them to Chinese students. However, it cannot be taken for granted that all definitions and instructions of CT will be made available to Chinese students, even those

definitions and instructions proposed by well-known Western critical thinkers. Since, CT is not consistent with strong traditions of Chinese culture, it may be hard for both Chinese teachers and students to accept some practices and concepts cherished by CT scholars in the West, and in this way different cultural contexts may not only shape how CT is taught and learnt but also how some aspects of CT are reinterpreted and understood, and if some aspects of CT are appreciated. Therefore, the difference between the knowledge of CT constructed in Chinese context and the knowledge proposed by scholars in the West is worth consideration.

1.2 The analytical framework and research questions

The analytical framework of this thesis is designed based on the factors and actors that usually influence the transformation of knowledge. KT studies commonly four factors that can influence the transformation of the knowledge, namely decision makers, access, background knowledge and culture. Three actors are usually involved in the construction of knowledge in a new context: decision makers, experts who provide access to the knowledge, and general learners of the knowledge.

A decision maker has the power of deciding why a certain type of knowledge is valued and what actions will be done to facilitate the KT. In this thesis the decision maker is represented by the MOE (Ministry of Education) in China. Through analysing documents published by the MOE, the thesis intends to shed light on the role of decision makers in the process of integrating CT into Chinese HE. Three research questions thus emerged as needing answers:

1. Why is CT valued by the MOE?
2. What has been done by the MOE to facilitate the cultivation of CT?
3. How has CT been talked about in documents published published by the MOE in different years?

The answers to these questions reflect both how the MOE has influenced Chinese universities and students, as well as how the MOE has contributed

to the construction of CT in China. Therefore, the MOE is both a factor and actor in this KT study.

Access refers to how learners get access to the knowledge that is being transferred. In this thesis 'access' is represented by a CT course at Peking University. Therefore the teacher of this CT course is also an actor involved in the construction of CT knowledge in Chinese HE. Through classroom observation the thesis intended to scrutinise what type of CT curricula had been adopted through which Chinese students can gain access to this new type of knowledge and thinking. This observation was designed to answer three fairly broad questions:

1. What was the teaching content of this CT course?
2. What teaching methods were adopted for this CT course is?
3. What was said about the relationship between CT and Chinese traditions?

Beside the decision maker and university teacher, university students are, of course, also important actors – indeed the most important ones. They can be seen as the consumers or general learners of the knowledge. The students' perception of CT will be examined through an analysis of Renren, the largest online schoolmate community in China. By reviewing students' posts on Renren, three research questions will be answered:

1. What does CT mean for the students?
2. What difficulties do they identify regarding the learning of CT?
3. What topics are discussed by the students when they mention the phrase CT?

Background knowledge and culture are also factors influencing the transformation of knowledge. These factors are considered through reviewing relevant literature. The review focuses on how the development of science has shaped different pre-existing knowledge and cultural background in China and the West. As knowledge base and culture are very broad concepts, I only focus on works that are taken as the classics in China and the West, and these are not all classics but only those related to

science, since in history, CT elements have been found in Chinese scientific thoughts (Needham, 1992; Paton, 2005; Feng, 1997; Cai, 1999; Han, 1999).

Scholars have been proposing knowledge about CT in Western context and now it is being learnt in Chinese context. Therefore, the ideas/elements contained in works by Western CT scholars will be reviewed, synthesized and compared to the CT knowledge constructed by the MOE, the CT module at Peking University and the students using Renren.

In sum, the analytical framework of this thesis involves four factors, the decision maker, the access, background knowledge and culture, and three actors, MOE, the CT course at Peking University (not the teachers' personal understanding of CT but what he taught to the class) and the university students. The knowledge of CT constructed by these three kinds of actors will be compared with works by some Western CT scholars, to see if some elements proposed in the West have not been adopted in Chinese HE.

1.3 An outline of the thesis

There are nine chapters in this thesis.

Chapter two starts with an introduction of seminal contributions to KT theory. These works show that there are four common factors, the decision maker, the access, background knowledge and culture that influence how the knowledge will be transformed when it is adopted in a new context. This chapter then reviews literature on the differences in background knowledge and culture between China and the West, which shows that there are actually quite some contributory factors for promoting CT in Chinese context. CT and Chinese traditions both have various elements and aspects. There is a lack of empirical evidence clarifying which elements of CT conflict with which elements of Chinese traditions and how. This chapter then present a synthesis of elements proposed by

Western CT scholars in order to compare with the elements adopted by Chinese policy makers, teachers and students.

Chapter three looks at the background of this thesis by reviewing literature on CT and Chinese education. Findings show that, firstly, CT has been emphasised in the process of building modern HE in China and that, nowadays, CT appears to be a part of advanced teaching in Chinese universities. Secondly, there is a lack of understanding regarding what aspects of Western CT are not taught in China. Instead, some literature are explaining the meaning of CT in a way that can make it easier to be adopted into Chinese culture, through focusing on the issues of reasoning skills and rhetoric.

Chapter four explains the research design of the thesis. This chapter states the philosophical framework of the thesis and describes and justifies the case study approach as well as the process of data collection and analysis, including the reasons for analyzing documents from the MOE and Renren, and the choice of the CT course at Peking University. The chapter ends with providing insights into the ethical process that was followed in the thesis.

Chapters five to seven describe research findings from the analysis of the MOE documents, the observation of the CT course at Peking University and the close reading of the Renren posts.

Chapter eight discusses what knowledge of CT has been constructed by Chinese policy makers, educators and students, and how knowledge of CT has been transformed compared to definitions by Western CT scholars.

Chapter nine provides an overview of the research findings, followed by a number of implications and recommendations for CT education. The limitations of the study are discussed as well as possibilities for future research.

Chapter 2 A Review of Studies on Knowledge Transfer

2.1 Introduction

KT refers to a process involving at least two organisations. One of the organisations (which is usually called the source unit) had developed a certain knowledge, while the other organisation (often called the recipient unit) have not yet. KT can be seen as the process through which this knowledge is gradually adopted by people at the recipient unit, after seeing the success of the source unit. Therefore, the construction of the knowledge at the recipient unit is based on learning and understanding the knowledge that was constructed at the source unit, which appears to be similar to 'transferring something'.

Differences between Chinese and Western cultural and social contexts mean that when CT is introduced to China from the West, Chinese educators may focus on only some aspects of CT over others; and the aspects of CT that they do not focus on might actually be quite important ones and might make CT more accessible and interesting to Chinese students. Therefore, the transformation of the knowledge of CT must be considered reflectively. At least, comparing the understanding of the knowledge constructed in a new context with the knowledge proposed by scholars in the birthplace of the knowledge is worth noting.

This chapter first reviews the four important factors that can influence which aspects of knowledge are more readily adopted than others. In short, these four factors will be referred to as: the decision maker, the access, the background knowledge and the culture. Secondly, this chapter will review literature related to the factors of background knowledge and culture, and show that in both China and the West, there are traditions that support and value CT. Thirdly, this chapter will review the knowledge of CT proposed by some Western scholars.

2.2 Factors that could influence knowledge transfer and transformation

KT has been defined as “the process through which one unit is affected by the experience of another” (Argote and Ingram, 2000, p. 151); “a process in which an organisation recreates a complex, causally ambiguous set of routines in new settings and keeps it functioning” (Szulanski, 2000, p.14); and a “process by which knowledge developed in a particular context is applied to another context” (Presseau, 2000 in Faye, Lortie and Desmarais, 2008, p.13).

Despite differences between these definitions, they all point out that KT involves a process and two units. One of the units (which is usually called the source unit) has a certain knowledge while the other unit (often called the recipient unit) does not. The knowledge must have caused an effect in its birthplace and this effect is wanted by other units, so the other units try to adopt this knowledge, just like through a transferring process the knowledge gradually appears in the recipient unit.

Bruce Kogut and Udo Zander (1993) investigated transferring thirty-five Swedish innovations to firms in different countries and found the success gained after the transfer depends on the degree of tacitness of the knowledge transferred, which “comprises codifiability, complexity and teachability” (p.627). Tacit knowledge is distinguished from the explicit knowledge. Explicit knowledge is what can be taught by words, while tacit knowledge can hardly be verbalized (Polanyi, 1966; Collins, 2010). The tacitness of knowledge relates to the degree to which the knowledge is possessed but cannot be taught by speaking or writing by people in the recipient unit. In this study, it was found that in the source unit the workers have more background knowledge about how to use complex equipment (which are scientific innovations) and are proficient in skills. Both of these conditions contribute to their efficiency. Therefore, the knowledge owners themselves are “a repository of knowledge” and serve as “efficient mechanisms for the creation and transformation of knowledge into economically rewarded products and services” (p. 627). This is how the knowledge sticks with the context, as it depends on experience of the workers.

In other words, certain knowledge has produced benefits based on local features of the context (such as what is common knowledge for local people), so in another context the transferred knowledge may not have the same effect because some basic knowing has not been transferred. What is more, since the decision of importing knowledge is usually based on an envisaged 'economic reward' (p. 627), the efficiency of producing this reward also affects the transfer by influencing managers' decision of continuing with the transferring process. In other words, the knowledge is related to the interests it can create. It is found that in some cases the managers may recombine elements of the transferred knowledge to make them suit the context of the recipient unit. In this way only part of the aspects of the knowledge will be provided in the recipient unit, and the managers would select and recombine the elements based on their background knowledge.A selection or recombination may be perfectly beneficial to the second unit. Only if the integrity of the original skill/knowledge is thought to be essential, then a selection or recombination would be inadequate.

Anil K. Gupta and Vijay Govindarajan (2000) proposed that the success of KT across nations is positively associated with economic value of the knowledge, recipient's motivation and capacity of absorbing the knowledge, and "the richness of transmission channels", based on a study of transferring scientific innovation and technology between firms in Europe, America and Asia. Using the term 'value of the stock knowledge', Gupta and Govindarajan pointed out that the value of the knowledge depends on how it can contribute to economic improvement for the recipient unit. Here it was mentioned that the managers, who choose which knowledge was important to the recipient unit will be more eager to transfer knowledge from firms in countries with higher economic development as they tended to believe that these countries/firms are richer because of the knowledge they apply. The motivation of absorbing knowledge depends on whether learners in the recipient unit are "under a pressure" of acquiring the knowledge and if they will be "awarded for relative improvement" (p.479). The absorptive capacity of the recipient depends on learners' pre-existing knowledge which determines their

"familiarity with the incoming knowledge" (p.480). The richness of transmission channels refers to the access to the knowledge base of source unit.

Gabriel Szulanski (1996) claimed that "the recipient's lack of absorptive capacity, causal ambiguity and an arduous relationship between the source and the recipient" were significant factors influencing achieving progress successfully after transferring the knowledge. This claim was made based on summarizing studies investigating transfer of best practices of organisations (such as method of management and logistics arrangement). The recipient's absorptive capacity was explained as the ability of decision makers to recognize the value of practices of the source unit and support the transfer, as well as learners' ability to practice according to the new knowledge (Dierickx and Cool, 1989 in Szulanski). This capacity in turn was determined by the value system and existing knowledge of the learners and decision makers.

Causal ambiguity meant that the learners do not know about how the knowledge produce the benefit exactly as some elements of the knowledge were undefined but collectively held by people (Rumelf, 1984 in Szulanski; Polanyi, 1962 in Szulanski). The arduous relationship meant that if it is hard to build communication between the source and recipient units, the learners will have less access to the source unit's knowledge base and therefore will learn less efficiently. Attaching value to certain practices is similar to the sociological definition of norm, which indicates how people are expected to behave in their society (Scott and Marshall, 2009). In this way, the recipient's absorptive capacity to value the knowledge of best practice is influenced by existing knowledge and culture of the recipient unit. Also, causal ambiguity can be equated with the influence of background knowledge as the elements of knowledge collectively held by people can be seen as the background knowledge.

Tatiana Kostova (1999) proposed that KT is embedded with "social, organisational and relational context" (p.312), based on studying transfer of strategic organisational practice between firms. The 'social context'

mentioned by Kostova is the institutional distance between source and recipient units (p.312). The organisational context was defined as culture of compatibility and degree of recipient's willingness of learning and making change (p. 313). The relational context referred to the relation between source and recipient unit, such as having a common parent company or having joint programmes. The institutional distance referred to the degree to which the members of an organisation know the benefit of following certain practices and attach value to these practices. The more the value system of the source unit was consistent with value system of the recipient's country, the easier it was for knowledge to be adopted (p.314).

As the value system is a part of culture (Scott and Marshall, 2009), this finding reflects the influence of culture on the KT again. Also, knowing value (or usefulness) of the practice is related to pre-existing knowledge. So Kostova's 'social context' actually indicates the influence of preexisting knowledge and culture. 'Culture of compatibility' refers to the degree to which this organisation was willing to accept new knowledge and initiating change. Some organisations refuse the transferred knowledge not only because the knowledge conflicts with their norms or values but also because they do not want to change. The degree of openness to adopt new norms and values is a type of culture too (Cartwright and Cooper, 1993).

Therefore, the Kostova's concept of 'organisational context' indicates the influence of culture too. Kostova's 'relational context' can be seen as referring to the influence of access, because this phrase is explained as having a better relation with the source unit to make the source unit willing to provide access to their knowledge base.

These four highly cited studies above have shown that although KT scholars have different names for the factors that influence KT, they all share a focus on **decision maker, access, culture and background knowledge**. The following sub-sections will look at these factors one by one.

2.2.1 The influence of the decision makers' choices

The studies above indicate that the economic value of knowledge is an important factor in KT. The managers of the recipient unit decide to import a certain type of knowledge because they see the knowledge as producing benefit in the source unit and the managers of the recipient unit wanted this result as well. In these cases, the benefit is the economic profit that is produced after conducting the transfer. This benefit represents the success of this transfer and determines how much the managers want to keep on investing in the transfer. In other words, this factor of economic value mainly influences KT through influencing the decision makers. The more the decision makers think the knowledge can bring economic profit, which is the result they want, the more they will be willing to support the transfer, and this support can in turn contribute to the success of the transfer, just like a circular pursuit. This indicates that in the process of KT there is a goal that motivates the decision makers to initiate the transfer.

Many other KT studies also commonly stress the influence of the decision makers. In various studies, KT starts with the decision makers seeing the competitive advantage of another unit in gaining in economic development or educational progress. Decision makers, either managers in businesses or directors in schools and departments, usually try to import knowledge from units which are known to them as successes and the decision makers focus on importing knowledge elements they think can produce a desirable result, which includes but is not limited to economic profit (Mu and Lee, 2005; Darr and Kurtzberg, 2000; Gilbert and Cordey-Hayes, 1996; Lam, 1997). When transferring knowledge from universities or research centres, the decision makers may take into account previous records demonstrating the usefulness of the knowledge created by these institutes (Agrawal, 2001; Ko, Kirsch and King, 2005). In this way, the decision makers use their own knowledge to decide from where to transfer the knowledge. This shows that there are similarities between KT in the business and educational context.

The decision makers may also filter the knowledge elements somehow before importing the knowledge. For example, they may only introduce

part of functions of an innovation to their own unit (Hargadon, 2003). In this way, the decision makers do not always provide learners with access to the whole content of the knowledge. Again, though decision makers had been careful in choosing a source unit and make a careful selection of aspects of knowledge they thought are useful (Darr and Kurtzberg, 2000), based on previous records of success, the transferred knowledge often cannot contribute to achieving their goal as efficiently as in the source unit (Tsai, 2001; Nonaka and Teece, 2001).

Many KT studies refer to the crucial role of economic value. This is because these studies investigate KT between businesses. In fact, economic profit is a common but not the only reason to support the transfer. For example, Chinese companies have been importing advanced technologies for educational reasons even though the technologies could not bring economic profit right away (Smith and Hamilton, 1995; Tsang, 2005). For another example, increasing rate of newly created innovations had also been the goal for conducting KT (Tsai, 2001). These goals can be seen as the value of symbolic performance. With these goals in mind, managers show eagerness in importing emerging technologies, sometimes not just for producing economic profit (Tsai, 2001; Tsang, 2005). In these cases the managers also decided to only introduce part of the technologies to make them applicable in their own companies.

Overall then, surrounding the factor of economic profit, it can be seen from these studies that decision makers import knowledge because they want to achieve a goal (in many cases this is economic improvement) that had been achieved elsewhere. However, the transferred knowledge usually cannot have the same effect in the recipient unit because it does not fit neatly into the new context. As a result, modifications may be made to better achieving the decision makers' goal. The decision makers' emphasis of the knowledge and the access they provide to introducing the knowledge also reflect how the transferred knowledge was constructed at the recipient unit.

2.2.2 The influence of background knowledge

Absorptive capacity is another important factor commonly discussed in KT studies. After the knowledge has been transferred, there will be those who adopt the knowledge in practice. How well these particular learners can master the knowledge also determines how efficiently the recipient can achieve the goal set by decision makers. The absorptive capacity of learners has been related to their background knowledge (Gupta and Govindarajan, 2000). It will be easier for the learners to master the knowledge if they already know something that can help them be familiar with the imported knowledge, such as meanings of terms used. Making use of innovations requires skills that are gained through experience. It has been found that workers in the recipient unit sometimes made less use of the innovation because they were less proficient in the required skills and they did not have the cumulative experience (Kogut and Zander, 1995).

In this way, the knowledge is bound together with people in the source unit. This bounding together with source unit is also called tacit knowledge. Tacit knowledge is a part of knowledge that cannot be codified and made explicit by words but those who have this part of knowledge can automatically use it to make sense and understand scientific theories (Polanyi, 1966). Therefore, tacit knowledge can also be taken as part of pre-existing knowledge that is held by people in the source unit. Also, different units have different knowledge bases that influence learners' absorptive capacity (Testa, 2012; Chen and McQueen, 2012). Overlap between the knowledge bases of the source and recipient units has been found to be positively associated with success of KT (Cummings and Teng, 2003; Darr and Kurtzberg, 2000; McEvily, Eisenhardt and Prescott, 2004; Ko, Kirsch and King, 2005). These are evidence showing that having pre-existing knowledge that is related to the incoming knowledge is positively related to success of KT.

Surrounding this factor of absorptive capacity, which is also commonly discussed in KT studies, it can be seen that background knowledge of the learners will influence their efficiency in adopting the knowledge. It is also obvious that in KT activities, what will happen in the recipient unit is

that the learners will try to acquire the knowledge and therefore the learners' understanding of the knowledge is also what constructs the knowledge in the recipient unit.

With regards to adopting CT in Chinese HE, various backgrounds may shape this 'absorptive capacity'. The background knowledge can be cultural and philosophical knowledge, ideology, the political system, parental and peer group pressures, the educational system and educational experience, etc. All of these backgrounds are very different in China to the West. In the West, CT is embedded in some countries at least in long traditions of culture, ideology, philosophy and education, which, especially after the Enlightenment, encouraged CT, both in science and in the humanities. These long traditions are missing in China which might make it difficult for individual Chinese learners to understand CT and, as a result, the HE sector will construct an understanding of CT that is problematic.

2.2.3 The influence of opportunity to access

A third factor that is commonly found to be influential is the availability of the transferred knowledge. In this thesis this is issue is discussed under the label of 'access'. The more "transmission channels" are built between the source and recipient unit, such as inviting experts and sending exchanges, the more ways there are to deliver the knowledge (Gupta and Govindarajan, 2000), the better the learners will master the knowledge. Facilitating communication and interaction with the source unit contributes to the success of KT by providing the learners with the opportunity to fain access to the knowledge that is bound with the context of the source unit (Kogut and Zander, 1993; Bresman, Birkinshaw and Nobel, 1999). Establishing cooperation between the two units can increase the knowledge experts' willingness to share knowledge (Ko, Kirsch and King, 2005). Building social networks and encouraging interactions between individuals in the two units influences the transfer positively by letting the learners see how their peers apply the technology in everyday life (Cummings and Teng, 2003; Gilbert and Cordey-Hayes, 1996). Also, providing more access, such as inviting experts to teach, establishing exchange programmes and

promoting communication between knowledge owners and learners, is found to be positively associated with successful KT (Simonin, 2004; Sroka, Cygler and Gajdzik, 2013).

If the learners do not have access to certain aspects to the knowledge, they will not know about these aspects and therefore have different understanding of that knowledge base. This might be difficult to detect because people may automatically think they have access to the knowledge and not question whether they have limited access to an aspect of the body of the knowledge. However, through these KT studies, we can rethink about the scope we have in learning new knowledge. All those claims above point out that building access is important to the success of KT. Having more access to the knowledge base means more knowledge is available for the learner. On the other hand, lack of availability means the learners cannot see the whole picture of the knowledge, do not know all elements of the knowledge and therefore acquire the knowledge less well.

In sum, surrounding the factor of access, it can be seen that in KT activities, what will happen in the recipient unit is that some materials will be presented to the learners and some chances will be provided to the learners for them to acquire the knowledge. Therefore, the materials and/or chances for learning reflect what the knowledge content is constructed in the recipient unit. This factor of access is also influenced by decision maker and has influence on the learners.

2.2.4 The influence of culture

A general degree of compatibility between the transferred knowledge and the local culture into which it is being transferred is essential for that knowledge to be accepted, absorbed and adopted. In other words, culture can influence the transferring process by either making some knowledge elements valuable to the decision makers and learners while some other elements are not valuable, or making the decision maker and learners simply do not want to adopt new knowledge. Being shaped by the cultural tradition, only those elements that make sense in the context of Chinese culture and politics will be adopted, other elements may be sidelined.

Beside the four studies above, many other studies also found that culture can influence both decision makers' and learners' valuing and getting used to the new knowledge (Berbegal, Lafuente and Sole, 2013; Feiereisen, Wong and Broderick, 2013; Osterloh and Frey, 2000; Simonin, 2004). Some elements of knowledge are culture-specific and cannot easily be transferred to another culture. This means that it is easier to transfer knowledge between similar cultures (Dinsmore, Baggetta, Doyle and Loughlin, 2014; Zhai, Cao and Dong, 2007).

Surrounding these four most frequently mentioned factors, how the knowledge is constructed in the recipient unit can be summarized as: the decision makers of the recipient unit want to achieve a goal that has been achieved by the source unit and they therefore conduct the transfer intending to import the knowledge that they think will contribute to achieving this goal. However, the decision maker has recombined part of the knowledge content when choosing what access will be provided to facilitate the transferring. In this way the decision maker and the access both influence the learners and reflect what knowledge has been adopted in the recipient unit. Knowledge that has been adopted by the learners is certainly a reflection of knowledge in the recipient unit as well. Due to the fact that learners have different culture and background knowledge and learners only have access to parts of the knowledge, certain aspects of the knowledge may also be re-interpreted. As a result, it is commonly found by many KT studies that some elements of the knowledge will be neglected in the recipient unit (Argote and Ingram, 2000; Lyles & Salk, 1996; Yang, Gao, Tan and Wong 2013; Simonin, 1999).

New content may be created when reconstructing the knowledge elements, but that also means the knowledge content in the recipient unit is different from the knowledge in the source unit. As a result, the transferred knowledge may have different effects when used or applied by the source unit. Perhaps in some cases, having reinterpreted knowledge is also helpful for the recipient unit, but if the effect is found disappointing, looking at the change of content can be a way to improve and move closer to the desirable

effect. It should be explained here that the difference of knowledge content between the recipient and the source units is not a difference caused by normal re-interpretation. The missing content I refer to here is an important part of the knowledge that is generally understood differently by various learners in the recipient unit and this part of the knowledge can contribute to the development or progress wanted by the source unit. In other words, comparing knowledge content between source and recipient units is not to compare if they are exactly the same but to compare if a crucial aspect has been understood differently, and that may be a part which the recipient unit will not want to change once its significance is realised.

There are other factors mentioned in different studies such as trust between the two units (Bruneel, D'Este and Salter, 2010) and cost of the transfer (Teece, 1981), but they are mentioned less commonly, which means they are not found significantly influential in many KT studies but one or two. I have not used these factors to construct the theoretical framework of this thesis for the reason that as they are not applicable in many KT studies, it is less likely (comparing to the common factors of background knowledge, culture, decision maker and access) that they will significantly influence the transfer of CT to Chinese HE.

2.2.5 Conclusions

Many scholars who study KT activities have found that the progress made by a recipient unit after KT can be influenced by decision makers, access, background knowledge as well as culture. These studies examine KT with relation to various types of knowledge. Some of the transferred knowledge involves mainly technical innovations while some involves more human behaviours. Some of the transferred knowledge involves mainly objective content while some more subjective elements. In all these studies decision makers, access and background knowledge have significant impact on the success of the transfer while for the transferred knowledge which involves more practices and subjective elements, culture (in particular norms and values) is a crucial factor too. Also, it can be seen from these studies that the construction of the new knowledge in the recipient unit involves three

kinds of actors: decision maker and general learners, as well as the access for which experts and teachers are involved.

2.3 Factors that could influence the knowledge transfer of critical thinking

As demonstrated above, the factor of culture will influence how people in the recipient unit value the knowledge, and the factor of background or pre-existing knowledge will influence people's familiarity with the new knowledge. This section will review literature on knowledge base and culture between China and the West. Literature on the factor of knowledge base is represented by some classics in Chinese and Western history. Literature on the factor of culture is represented by studies on Chinese and Western norms and values. As will be reviewed, in both China and the West, there are culture of valuing CT and classics that introduce concepts related to CT.

Geographically, 'the West' emerged in Western Europe but through immigration and colonization, this term now also applies to countries in the Americas and Australasia (Hall, 1992). In the aspect of civilization, it is generally recognized that Western civilization begins in ancient Greece and is shaped by historical events such as the Renaissance, the Scientific Revolution and the Enlightenment (McNeill,2010; Spielvogel, 2016). The concept of 'the West' used in this thesis is based on this general recognition. As will be reviewed below, the classics involved are works published during relevant Western historical events, and the literature on values and norms are is derived from works written in Western countries such as the UK, the US, Australia and Canada.

2.3.1 The influence of background knowledge

In the West, the tradition of valuing CT in education can be traced back to Socrates and Socratic Questioning. This was a method based on asking critical questions and testing the logic of statements (Vlastos, 1983; Copeland, 2005). This educational philosophy of encouraging questioning was carried on by Plato, Aristotle as well as other Greek

sceptics who regarded it as the essence of scientific method (Lloyd, 1991; Jarratt, 1983; Solomon, 1996). This educational philosophy of encouraging questioning by Socrates is also regarded by current educators as the origin of CT (Paul, Elder, and Bartell, 1997).

In the long history of science in the West, methods of observation and experiments have been used to collect evidence for establishing and challenging scientific theories: Kepler and Galileo's pointing out counter-observational evidence and developing the Heliocentric theory which replaced the Geocentric theory of the universe (Okasha, 2002); Francis Bacon's (1605) emphasising the importance of doubting, realizing false understanding that could be constructed due to people's habit of thinking, and considering the possibility of using empirical evidence inductively to reach conclusions (Nichol, 1901); René Descartes's (1628) principle of sustained and systematic doubt for guiding people's way of thinking (Sorell, 2000); and Isaac Newton's (1687) rules of scientific reasoning which started the traditional worldview of only believing claims reached through soundly reasoning evidence (Harper, 2011); etc.

Ways to understand the uncertainty of scientific theories are important ideas for this 'scientific method'. Additional evidence, alternative explanation and best explanation are all important ideas for understanding this uncertainty. For example, Popper's (1959) falsification method claims that the scientific method should be a continuous process of refutation, so scientific theories are not right for certain but temporarily valid and can be disproved in new tests when additional phenomena are observed. Kuhn's (1996) *Structure of Scientific Revolutions* (firstly published in 1962) reveals how paradigms were replaced by an alternative when counter examples accumulated until they could no longer be ignored.

Science seeks explanations after observing natural phenomena, and uses explanations to seek the cause and prediction of future events (Okasha, 2002). However, there are times when limitations were crept in because equipment improved. Experiments provided additional phenomena and

made the old best explanation no longer the best and subsequently an alternative which can explain more replaced the old one. For example, the Phlogiston theory could explain why some materials could get burned while some others could not, but when the weighing scale/balance was put into use, this theory could not explain why the mass increased after burning and subsequently got replaced by the Caloric theory (Giunta, 2001).

The methods above can be summarized into a way of thinking that is a kind of academic rigor in producing creative ideas through comprehensively analyzing existing information. People may generally think that 'scientific method' is a good method, but for academic members this is a more complex term. 'Scientific method' refers to a systematic way of making observations, developing testable predictions and gathering data to answer the questions (Rovelli, 2012; Charnock, 2010; Cortazzi and Jin, 2010). It is neither a kind of method that is absolutely believed as being correct, nor a kind of method that is not stable. Instead, scientific method is both systematic and standardized, and involves an attitude of keeping an open mind to various kinds of information. It is, for a period, a kind of routine that rules which information to be analysed (systematic) and how should these factors be analysed (standardized), and at the same time pays attention to the increase of the amount of information, including information indicating beliefs contrary to established ideas.

Questioning, doubting and finding the most reliable way of thinking knowing there is uncertainty due to the limitation of the present level of knowledge are important elements of this scientific method (Sarton, 1932; Rovelli, 2012). This 'scientific method' had important influence on Western people's belief about how people should view the world, and set a tradition of requiring reason and evidence and questioning existing beliefs (Wüthrich, 2011; Freundlich, 1978; Henry, 2001).

Since methods of doubting, reasoning and using evidence are all important aspects of CT (Facione, 2007; Paul, 2010; Ennis, 2003), those classics of

scientific methods works can contribute to being familiar with CT and therefore makes the learning easier. In this way, knowing some content of scientific methods can familiarize people with this aspect of CT, especially in the sense of thinking reflectively of one's beliefs.

In the Chinese knowledge base, background knowledge of CT can be located as well. Although Chinese tradition of CT is generally seen as falling behind in the West (Xin, 2000), some of the analysing methods above are also mentioned in Chinese classical works. In the second volume of Needham's *Chinese Civilization of Science*, he specially presents the history of Chinese scientific thought (1991). In this book, Needham claims that scientific thoughts can be found in various schools of thought in Chinese history, namely Confucianism, Taoism, Mohism, Legalism and Buddhism.

Among these schools, Needham (1969) particularly praises the contribution of Taoism to Chinese science and holds that a part of it is comparable to scientific methods developed before Aristotle's time. "Tao" is an abstract idea indicating that there is a general and universal way to see happenings in the world. It entails the law of cause and effect for everything. People should observe large amount of particular events and try to understand what this law is. In this way, the content of "Tao" is similar to induction, which is "a process of thought that uses known facts to produce general rules or principles" (Longman Dictionary). Therefore, this can be taken as evidence showing that logic exists in Chinese knowledge base.

Schools of Confucianism, Monism, Legalism and Buddhism also have some ideas that can be seen as scientific method (Needham, 1991) though these schools paid more attention to moral, political, and religious issues rather than the nature (ibid). Confucianism is widely seen as caring little about the nature but focus intensively on political achievement and in this way it causes a barrier for science development in Chinese history. However, it was claimed by Needham that Confucianism contributes to

science (despite it hindered science badly) by emphasising rationality and rejecting blind religious beliefs.

Mohism, also referred to as dialectical Mohism, contributes to scientific thinking by proposing a clearer (than Taoism) step by step inductive and deductive inference method, similar to syllogism (Gao, 1987; Xu, 2013; Yuan and Zhou, 1998). Also, paradoxes illustrating the opposing sides are co-existed and using counter-examples to debate to illustrate that the two opposite poles may both contain some truth are found in classical Mohism works (ibid). Therefore, formal and dialectical logic are developed somehow thanks to this school.

Legalism contains the idea of daring to challenge the authority based on terms of the law, and it had been a principle based on which emperors in Chinese history consider how to rule the country (Li, 2011). Although this school of philosophy was put in a less important position in Chinese history, which again shows the power of authority in Chinese tradition (Needham, 1991), it still produces a background for believing that the authority can be challenged under certain conditions.

Buddhism also transferred ideas of logic to China (from India). According to Needham, this part of logic was adopted in Chinese tradition and integrated with the logic in Taoism and Mohism.

As reviewed above, the development of scientific method, in the sense of requiring reason and evidence and questioning existing beliefs (Wüthrich, 2011; Freundlich, 1978; Henry, 2001), had important influence on Western people's tradition, and therefore it can make CT familiar to Western people. It seems such tradition also exist in Chinese knowledge base. Making observation, using reasoning skills and challenging authority also exist in Chinese classics.

In contemporary time, Western concepts of scientific method, in the sense of a systematic way of making observations, developing testable predictions and gathering data to answer the questions (Rovelli, 2012;

Charnock, 2010; Cortazzi and Jin, 2010), are being imported into China. In 1990, China began to engage with issues of Public Understanding of Science and Public Scientific Literacy (China Association of Science and Technology, 2002), which have long traditions in the West (Gregory and Miller 1998). What's more, the government has carried out some activities to improve Chinese public scientific literacy, such as promoting reading science books in communities (Chen, 2011; Yao, Li and Zhang, 1995), which is again similar to activities in the West (Durant, Evans and Thomas, 1989; Yao, Li and Zhang, 1995).

Therefore, there are background knowledge related to CT in Chinese context as well. Instead of saying that Chinese traditions are bad for developing CT as a whole, there is a need to study how CT is adopted into Chinese context and specify how the factor of background knowledge is influencing Chinese students' adoption of CT. Chinese classics contain various knowledge points and have similarities and differences comparing to Western works. In hence, there is a need to discuss which elements of relevant background knowledge in Chinese classics may influence people to understand CT differently. This discussion will be written about in chapter eight, after studying how CT is taught and understood by Chinese teachers and students.

2.3.2 The influence of culture

According to KT studies, the influence of culture is that it may directly encourage or discourage Chinese social actors to accept certain aspects of CT. This section reviews some values and norms that have been popular in China and the West in more recent times, and discusses how this may contribute to their accepting and valuing CT.

The sociologist of science Robert K. Merton proposed that important scientific norms namely communalism, universalism, disinterestedness, and organised scepticism govern scientific research in Western countries (Merton, 1973; Ziman, 2000). The scientific norms of organised scepticism reflect a culture that encourages CT. According to Merton (1973), organised scepticism is:

> "both a methodological and an institutional mandate. The temporary suspension of judgment and the detached scrutiny of beliefs in terms of empirical and logical criteria have periodically involved science in conflict with other institutions. Science which asks questions of fact, including potentialities, concerning every aspect of nature and society may come into conflict with other attitudes toward these same data which have been crystallized and often ritualized by other institutions." (p. 277).

Making reasoned judgment, thinking about what to believe and asking questions are all important elements of CT (Ennis, 2003; Facione, 2007). As scientific norms support these behaviours, they also provide support for people (in particular scientists) to value CT and think critically in practice. Therefore, this organised scepticism can be seen as a cultural support for CT and a proven record for western culture valuing CT.

It has been claimed by some that Chinese traditional education where the focus was on emulating past knowledge rather than creating new knowledge and there was no similar norm of scepticism in China (Suttmeier, 1984). However, more recent Chinese articles explicitly state that a system that encourages scholars to evaluates and judges each others' works and established theories has been established with reference to international standards (Zhou, Shen and Zhang, 2005; Yu and Jin, 2003; You, Lu and Zou, 2006). As a result, it is may be unfair to say that scientific norms (including organised scepticism which may culturally support CT) are definitely not established in China.

There are both positive and negative cultural elements for CT in Chinese context. In China, 'science' and 'democracy' were used as the two slogans to resist the imperial culture during the May Fourth Movement in 1919 (Xin, 2000). These two slogans represent the values of seeking truth through experiments/practices and discussing with government equally. They were expected to reform Chinese people's thinking just like the Enlightenment did in the West (Zhang, 2010), during which Western

people were encouraged to think critically by daring to develop their own judgment (Kant, 1784; Henry, 2001). This movement was "soon interrupted by social and political revolution" and this fact "disqualified the Chinese May Fourth movement from being defined as "enlightenment" (Zhang, 2010, p.15). However, nowadays this process was regarded as a great start of reforming how Chinese people think and spread values such as freedom of speech or values of independent thinking in China.

It is unfair to say that this history did not contribute to a cultural context that values CT. On the contrary, important historical events may indicate a entrenched culture (Susman, 2003; Morton and Lewis, 2005).

Nowadays, CT is valued in the education system in both China and the West. In the Western education system, the culture of valuing CT has existed long history. In modern times, the Western tradition of emphasising CT in education can be traced back to early 20th century when the American sociologist William Graham Sumner (2013) proposed that their schools had educated people into one pattern (orthodoxy), while CT is needed for making good citizens who "can wait for and weigh evidence" (ibid.). It was also believed that teaching CT as part of the HE curriculum is not only beneficial for learners but also for promoting the entire democracy (Dewey, 1916; Benesch, 1993). The CT Movement, which emerged in the United States in 1970s, started the tradition of fostering CT in Western education systems (Ennis, 1991; Paul, 1990). Important figures in this movement include Robert Ennis, John McPeck, Richard Paul, Israel Scheffler, and Harvey Siegel (Popkewitz and Fendler, 1999; Kohli, 1995; Thayer-Bacon, 2000). CT then became an important part of the liberal education system in the US and a quantitative evaluation system testing students' CT skill was built (ibid).

Today CT is an important part of Western educational philosophy and is regarded increasingly as important in universities and graduate schools (Brookfield, 2000). Especially in the United States, educators believe that the primary purpose of education is guiding students to learn how to think

(Halpern, 2003). Fostering CT of students has been one of the important goals of American educational departments (Education Resources Information Centre, 1983; National Education Goals Panel, 1991). In the British education system, courses training CT are also available (Paul and Elder, 2011; Elder, 2000) and British educators also frequently express concerns about cultivating CT (Rimer, 2011; Bartels, 2013). All such information indicates that CT has been a core educational philosophy in Western education system.

In China there has not been an equivalent CT movement (Wang, 2013). However, there is evidence showing that CT is being highly valued by some Chinese educators. On newspapers there are contents showing complaints and worries of a lack in CT (Chinareviewnews, 2011; Ynet, 2011; People, 2011). Although similar worries can be heard among Western educators too (Gabennesch, 2006, Mataconis, 2011), it is often particularly mentioned among educators who focus on Chinese education that Chinese students lack CT, a concern voiced both for Chinese international students (Jing and Graham, 2011;Tian, 2008) or those study in China (Qian, 2011; People, 2011). These concerns show that CT has received great attention in Chinese education system.

There are both literature showing that CT is being valued in Chinese education system and that Chinese culture discourages CT because of its emphasis on respecting authority, advocating collectivism and conformity, rejecting individualism (Atkinson, 1997; Ho and Chiu, 1994; Li and Liu, 2006), and traditional teaching methods, such as reciting what is taught without questioning (Tian and Graham, 2010; Jones, 2006). As a result, it is again hard to decide how CT is valued in Chinese education system. As cultural support and cultural conflict co-exist, CT could be biased or accepted. Nevertheless, this mixing of cultural support and conflict makes it even more interesting to study empirically how and why CT is valued, and what methods are used to adopt CT into Chinese education system.

2.4 The knowledge being transferred in this thesis

According to KT studies, the content of the knowledge will be transformed when adopted by the recipient unit. In this thesis, CT is the knowledge that is being 'transferred', i.e. being learnt in a different context----Chinese HE. As will be reviewed in this section, the culture of some important critical thinkers, such as Dewey, Facione, Ennis, McPeck and Paul, is Western. In this sense, CT knowledge that was proposed by these Western critical thinkers, can be seen as Western knowledge and it was proposed in Western context. Such knowledge has been learnt about by Chinese policy makers, educators and students, whose reinterpretations and understandings has been constructing CT knowledge in Chinese context. The following passages of this section will review some important theories related to CT proposed by Western CT scholars.

In Dewey's (1910) *How We Think*, he claims that 'the essence of critical thinking is suspended judgment; and the essence of this suspense is inquiry to determine the nature of the problem before proceeding to attempts at its solution. This, more than any other thing, transforms mere inference into tested inference, suggested conclusions into proof.' (p.74). To determine the nature of a problem, there is a need to understand the conditions of the problem, for which one needs to collect relevant information. Such information can be gathered through making inquires. Inferences that are made after this process of inquire can be seen as tested, as the inference is based on evidence that is checked and agreed on by whoever it concerns. Even though, conclusions made based on tested inference cannot be seen as absolute results but only as advisable solutions.

The importance of being aware of uncertainty can be seen in Dewey's definition of CT. As there can always be sudden changes, there is a need to be able to make inquires to find an answer for the questions presented by changes that are out of expectation. Also, Dewey found that CT requires the ability to evaluate possible solutions based on incomplete and unverified information. In practice, it is very hard to ask for a perfectly complete set of information. Making decisions under conditions of uncertainty and assessing the validity of a truth claim are therefore both unavoidable. This understanding of CT can also be seen through Dewey's

philosophy of education, which is that the value of education is to help students to adopt this inquiring process and attain 'correct habits of reflection' (p.6).

In America, Dewey's educational ideals of teaching students to be critical have influenced teacher training for decades afterwards (Thomas, 2013). Dewey's ideal of teaching students to be critical, i.e. making inquiries to test the suggested conclusion, also corresponds with the sociologist Sumner's (1906) ideal that the role of education in a society is producing 'well-developed critical faculty' which 'holds everything open to unlimited verification and revision' and 'can hold things as possible or probable in all degrees, without certainty and without pain. For Sumner, good citizens can 'wait for evidence and weigh evidence' (pp. 632-633) and dare to challenge 'their dearest prejudice' (p. 632).

In the U.K., Rousseau's educational ideal of fostering learners' cognitive growth has been influential (Thomas, 2013; Fennell, 1979). Following this tradition, educators emphasised letting students find out answers by themselves to foster the growth of knowledge in their minds, instead of requiring students to remember what is told (Hadow, 1931; Plowden, 1967). Students are therefore encouraged to think critically in order to justify, test and make inquires. By finding their own answers students can construct their own knowledge and find their answers independently. These educational ideals also indicate that rote learning was abandoned for inquiry based learning and CT, as existing knowledge were no longer seen as absolutely correct.

Since CT had been valued, there was a need of measuring the students' CT. The development of psychology can be seen as influential to the development of theories of CT (Hayes, 2006; Cremin, 1961). The development of psychology produced a series of methods of observing and analyzing participants' behaviors to understand what they were thinking (Polkinghorne, 1983). In these contexts, tests were also designed to make it possible to assess CT through observing participants'

performance in activities, such as answering questions and finishing writing tasks, and comparing their performance with criteria.

Watson and Glaser designed the first widely used instrument to measure CT----the Watson-Glaser Critical Thinking Appraisal (WGCTA) (Tian, 2008; Loo and Thorpe, 2005). This is a multiple choice test focusing on testing skills of inference, recognition of assumptions, deduction, interpretation, evaluation of arguments. The answers to these multiple choice questions indicate the attitudes that participants will adopt facing certain circumstances. According to Glaser (1941), CT is not entirely different from remembering certain facts, as one of the three aspects of CT is knowing certain logic rules and inference methods. The other two aspects are students' CT skills of applying these methods and attitudes of considering the problems and subjects thoughtfully. The attitude of CT, according to Glaser, comes from one's experience.

Ennis is generally regarded as a scholar who contributed to making CT popular in HE in 1960s for CT (Tian, 2008). He defined CT as 'reasonable reflective thinking that is focused on deciding what to believe or do' (1987, p.10). To complete this decision making process, one needs to have 'a set of CT dispositions' as well as 'CT abilities' (1987, p.11). Having a CT disposition refers to a will of thinking critically and reflexively about one's own claims and other people's claims. The CT abilities are referred to as skills of: identifying reasons and conclusion in statements; checking the credibility of evidence; observing and making one's own hypothesis; making inductive and deductive inference, conducting experiment and considering alternative possibilities; judging which is the best explanation and generalization/limitation of a conclusion (ibid).

Another seminal author, McPeck (1981), defines CT as 'the propensity and skill to engage in an activity with reflective skepticism' (p. 8). He also understands CT as a subset of rational thinking. Similar to Ennis, McPeck also holds that being willing to doubt and being able to doubt are two aspects of CT (i.e. having a disposition to CT). The propensity is again a willingness to apply CT skill voluntarily, and the CT skills proposed by

McPeck also involve identifying evidence, checking credibility of the evidence, the inference process, and doubting the conclusion. McPeck emphasises the importance of being sceptical when one is processing information. Yet, the meaning of this scepticism is not only to refute false conclusions but also to think about alternative possibilities. Instead of saying a conclusion is necessarily wrong, one can remain skeptical by thinking that there may be other explanations. For this reason, a good critical thinker for McPeck is one who is able to think up other reasonable explanations, and one who has an open-mind to other possibilities. Being able and willing to provide alternative explanations, as proposed by McPeck, is an element of CT.

Similar to McPeck, Paul's (1982) theory of CT also involves the relationship between CT and epistemology. He proposed the ideas of strong and weak sense of CT. The strong and weak sense of CT respectively refer to critiquing one's own position and others' position. The strong sense of CT, critiquing one's own point of view, is related to thinking respectively about the knowledge we had accepted, about what we had believed, in order to update it with better knowledge. Paul also proposed that CT has several features. Firstly, a deep knowledge of oneself, as one needs to be clear what he or she had believed before he or she can think reflectively about these beliefs, and beware of being influenced by his or her implicit beliefs, as people often insist on an opinion based on beliefs they unconsciously hold. Knowing as much beliefs one hold requires an understanding of one's own epistemology. Secondly, having intellectual courage and humility at the same time, which means a strong critical thinker will dare to challenge others' claims, but will also be willing to consider others' claim and re-consider his or her own claims. Thirdly, being able to understand the bigger picture holistically. A good critical thinking needs to consider what others can see from their point of view. This requires the critical thinker to be tolerant and overcome his or her egocentric and sociocentric (centered on one's own social group) empathy. By doing so the critical thinker will have better ability to have dialogues with people who have different culture and worldview. Paul's conception of CT can be seen as dealing with various

kinds of information, in particular the information expressed by people holding different, even opposite opinions, and information about oneself.

Paul (1993) also claimed that CT involves intellectual virtues which include 'intellectual integrity, intellectual humility, fair-mindedness, intellectual empathy and intellectual courage' (p.21). Being fair and showing empathy, i.e. sharing feelings of others, both depends on people's value system. Paul also claimed that those virtues are important for moral integrity, since by adopting such virtues one can overcome the problem of egocentric and ethnocentric thinking. Therefore, Paul's conception of CT involves the element of moral consciousness, in particularly, seeking fairness, equality and caring about others' feelings.

Siegel (1990) defined CT as being "appropriately moved by reasons" (p.38). He explained CT as a process of reason assessment. Siegel particularly discussed the notion of CT and the relationship between CT and rationality. In particular, if being rational is to believe and act based on some reasons, then CT is similar to principled thinking, i.e. rational people are supposed to reason based on certain established principles. For using CT to decide something, there must be some premises that are commonly agreed on and inquiring the premises must not be an endless process. Siegel proposed that CT contains a tolerance for relativism, i.e. understanding that knowledge, truth and morality are constructed in relation to cultural and social context. He also claimed that one aspect of CT is critical spirit which is being committed to make judgment based on reasons.

Facione (1990) initiated the Delphi Report Project and found that the key elements of CT include: interpretation, analysis, evaluation, inference, explanation and self-regulation. These elements are summarised based on opinions of 46 CT experts from philosophy, education, social sciences and sciences. Based on this finding, Facione designed the California Critical Thinking Dispositions Inventory (CCTDI) test, which contains 75 questions based on 7 subscales evaluating participants' characteristic traits of truth-seeking, open-mindedness, analyticity, systematicity, self-

confidence, inquisitiveness and cognitive nature, and the California Critical Thinking Skills (CCTST) test, which contains 34 questions based on 5 subscales evaluating participants' skills of analysis, evaluation, inference, deductive reasoning and inductive reasoning.

So far some scholars' theories and findings have been reviewed. It can be seen that the scholars had proposed different kinds of CT. There is a way to merge these definitions of CT by classifying their elements into various aspects.

Ennis emphasized the element of knowledge of logic while McPeck emphasized the element of knowledge of subjects/disciplines (Mason, 2008; Tian, 2008). Beside distinguish different kinds of knowledge, what can also be done is classifying the knowledge of subject, including the epistemology of the subject and the technical language of the subject, into an aspect of CT, namely the evidence aspect, and classifying the knowledge of logic into another aspect of CT, namely the reasoning process aspect.

CT experts commonly have disagreement in the relationship between CT disposition and other components such as emotion, beliefs, value system, etc (Facione, 1990). Beside linking CT disposition to various kinds of mental activities, what can also be done is classifying the content of values and beliefs as a kind of premise, and simplify the disposition aspect as the willingness and courage to check all the evidence and use it to support any inference. Since the content of one's beliefs is a kind of premise, it can also be seen as a kind evidence.

The elements proposed by those CT scholars can therefore be classified into four aspects, which respectively deals with evidence, the reasoning process and the conclusion, and the disposition, i.e. being willing to critique:

1. The aspect dealing with evidence includes being able to discover facts, obtain information and confirm the truthfulness and relevance of the

information. Both supportive and contrary evidence need to be considered. This aspect also includes uncovering the underlying assumptions, which can be values, opinions, stereotypes or anything taken for granted, and decide if these assumptions are defensible.

2. The aspect dealing with the reasoning process includes synthesizing and analysing information and making logical inferences, abstraction and generalizations. By appealing to certain criteria or principles, one can construct a reasoning process or assess others' reasoning process. Rules of deduction, induction and logical fallacies, such as the switch of concepts in the argument (disguised replacement of concept), are the main content of the criteria and principles referred to by Western critical thinkers.

3. The aspect dealing with conclusion includes evaluating others' conclusion and making one's own decision. What is more, one needs to decide what to believe or do when there is uncertainty. In many cases the information is incomplete, so one needs to decide how strong is the conclusion supported, weigh up supportive and contrary evidence and be aware of alternative possibilities and explanations.

4. The aspect dealing with disposition includes an attitude of being disposed to inquire. It is the propensity to doubt and the desire of using logical criteria to assess statements. Courage is a also very important element of this aspect since it is needed when challenging statements made by authorities.

Besides the elements above, in more recent years, Western CT scholars are keeping on proposing definitions of CT. The elements contained in these definitions can also be classified into these four aspects, which will be presented below.

Argumentative language and argumentation and interactive training (Bensley and Haynes, 1995; Sanders, Wiseman and Gass, 1994; Alston, 2001; Yeh and Chen, 2005) can be classified into the aspect of disposition, since the experience of being encouraged to debate can enforce the

willingness to critique. On the other hand, the teachers' resistance to change and inadequate instructional language can inhibit students' tendency to think critically (Mangena and Chabeli, 2005; Torff, 2005). This *will to doubt* may be related to habits that are unconsciously developed by living in particular cultural contexts (Atkinson, 1997), as people's experience can naturally give them an impression that acting in some ways will work things out, which can be called an adaptive rationality (Chan and Yan, 2008). These ways of acting will become their routines. They tend to act in these ways, though such routines are not fixed as people can think critically about their routines and form new tendency (ibid). There are some scholars claiming that CT is rooted in moral perspectives and particular values (Burbules, 2004) and CT disposition depends on deeply held beliefs (Goldberg, Kingsbury, Bowell and Howard, 2015). The feelings and emotional experience associated with these values and moral beliefs should not be ignored as they influence people's use of cognitive skills and they motivate people to decide differently (Thayer-Bacon, 2001; Reichenbach, 2001). Also, people need their feeling system to understand others' feeling, which is a necessary base for morality. What should be noticed is that the morality issue involves both the content of the moral beliefs and being sensitive to the moral beliefs (Lipman, 2003). The content of the moral beliefs can be seen as a part of the evidence aspect, since complying with it can be considered as a premise before making the decision. Being sensitive to the moral beliefs can be classified into the disposition aspect, since it leads people to be willing to seek for morally good results. So the elements regarding morality or values can be divided into two parts. The first part can be understood as knowing the moral principles and knowing what some values tell people to do. This can be classified as an element of the evidence aspect. The second part can be understood as having a strong feeling of doing so, i.e. desire to do so. This can be classified as an element of the disposition aspect.

The aspect dealing with evidence also includes being able to discover facts, obtain information and generate knowledge from what one reads or hears, and confirm the truthfulness and relevance of these evidence

(Bloom, 1956; Facione, 2007; Reichenbach, 2001). A good critical thinker should be able to uncover the underlying assumptions within the evidence, which can be values, opinions, stereotypes or something taken for granted, and decide if these assumptions are defensible and consider both supportive and contrary evidence (Drennan, 2010). Some scholars claim that identifying and evaluating assumptions and being familiar with criteria for professionalism of the subject are seen as two activities that allow CT in education field (Yanchar, Gibbons, Gabbitas and Matthews, 2016), and the subject knowledge and knowing how to check truthfulness and relevance of premises should be combined when performing CT (Bissell and Lemons, 2006). Therefore, being familiar with the subject knowledge, the criteria of a discipline and being aware of assumptions are elements of the evidence aspect. What's more, understanding the complexity and insights of a problem and thinking reflectively of one's own reasons (Swartz, 2004) can be classified as a part of the evidence aspect, since these elements are reminding us to collect more information to analyse. Interpretive skills (Hughes and Lavery, 2015), the skills of understanding the nature of the problem, can also be classified into the evidence aspect, since these skills are helpful for clarifying the evidence. The necessity of recalling and retaining memory (Halpern, 2014) can be seen as elements of the evidence aspect as well.

The aspect dealing with the reasoning process includes making logical inferences, abstraction and generalizations (Reichenbach, 2001; Gadzella et al., 2005). Synthesizing and analysing the plenty of evidence systematically can be classified into this aspect (Swartz, 2004), since when evidence is rich, the reasoning process will not only be a simple deductive or inductive reasoning but requires organising the premises orderly and structurally. Also, by appealing to certain criteria or principles, one can construct a reasoning process or assess others' reasoning process (Paul, 1993; Lipman, 2003; Siegel, 2001; Elder, 2000; Albert. R.T., Albert. R.E. and Radsma, 2002). Rules of deduction, induction and logical fallacies, such as the switch of concepts in the argument (disguised replacement of concept), are the main content of the criteria and principles (ibid). The criteria of a particular discipline is classified as a part of the

evidence aspect instead of the reasoning process aspect, as it is a part of knowledge of the subject. Processing evidence based on the normative standards of reasoning and logic has always been emphasised by CT scholars (Hughes and Lavery, 2015), though they are not the only core elements of CT (Chan and Yan, 2008).

The aspect of conclusion includes elements of weighing up supportive and contrary evidences (Siegel, 2001), deciding how possible the conclusion is correct and when to stop doubting (Hare, 1999), being aware of alternative possibilities and explanations (Lipman, 2003), being flexible with decisions or judgments and keeping an open mind to multiple perspectives can be classified into the aspect of conclusion (Swartz, 2004), since these elements are reminding us to recognize that what we have reached based on the analysis is uncertain and there are alternative conclusions. As will be reviewed in chapter eight, these contents are also part of philosophy of science in the West. Strategies of judging likelyhood and uncertainty are useful for making choice between the alternatives (Halpern, 2014). Making the choice is also influenced by implicit evidence, such as emotional experience and desires, and an attitude of not worrying of uncertainty. These aspects are interrelated. Verification skills (Hughes and Lavery, 2015), the skills of establishing the accuracy and validity of something can be classified into the conclusion aspect, since deciding how strong the conclusion is supported needs such skills. Certainly, checking accuracy and truthfulness of the evidence is also needed.

In conclusion, after unpacking the conception of CT proposed by different CT scholars in the West, it can be seen that they have been describing the four aspects of evidence, reasoning process, conclusion and disposition using various terms and phrases. For example, the disposition aspect has been described as the CT attitudes, spirit and courage. The table below lists the terms and phrases describing elements of the four aspects:

Evidence	**Reasoning process**	**Drawing Conclusions**	**Disposition**
Inquiring the grounds (Dewey,	Tested inference	Possible solutions	Habit of reflection (Dewey, 1910;

1910; Facione, 1990); Nature of problems (Dewey, 1910) Ongoing changes (Dewey, 1910); Weighing evidence (Sumner, 1906; Siegel, 2001); Recognizing assumptions (Glaser, 1941; Yanchar, Gibbons, Gabbitas and Matthews, 2016); Interpretation (Glaser, 1941; Hughes and Lavery, 2015); Identifying the evidence (Ennis, 1987; McPeck, 1981); Checking credibility (Ennis, 1987; McPeck, 1981; Bloom, 1956; Facione, 2007; Reichenbach, 2001; Bissell and Lemons, 2006; Swartz, 2004); Evaluating evidence (Facione,	(Dewey, 1910; Glaser, 1941; McPeck, 1981; Facione, 1990; Reichenbach, 2001; Gadzella et al., 2005); Seeing fallacies (Postman and Weingartner, 1971); Induction and deduction (Glaser, 1941; Ennis, 1987); Logical rules (Glaser, 1941); Systematical analysis (Facione, 1990; Swartz, 2004); Reason assessment (Siegel, 1990); Principles of good reasoning (Siegel, 1990; Paul, 1993); Standards of good reasoning (Lipman, 2003; Siegel, 2001; Elder, 2000; Albert. R.T., Albert. R.E. and Radsma, 2002; Chan and Yan, 2008; Hughes and Lavery, 2015)	(Dewey, 1910); Possibility and probability (Sumner, 1906; Ennis, 1987; Halpern, 2014); Original answers (Hadow, 1931; Plowden, 1967); Uncertainty (Dewey, 1910; Sumner, 1906; Holt, 1964; Halpern, 2014); Evaluation of arguments (Glaser, 1941; Facione, 1990); Deciding what to do or believe (Ennis, 1987); Making hypothesis (Ennis, 1987); Considering alternatives (Ennis, 1987; McPeck, 1981; Lipman, 2003); Making good decisions (Facione, 2006); When to stop doubting (Hare, 1999); Multiple perspectives (Swartz, 2004);	Ennis, 1987; McPeck, 1981); Good citizenship (Dewey, 1910; Sumner, 1906; Ten Dam and Volman, 2004); Attitudes of considering problems (Glaser, 1941); Tendency to doubt (Ennis, 1987; McPeck, 1981); Skepticism (McPeck, 1981); Intellectual courage (Paul, 1982); Intellectual humility (Paul, 1982); Truth-seeking (Facione, 1990); Not necessarily aggressive (Facione, 2006 Keeping an open mind (Facione, 1990); Self-confidence (Facione, 1990); Affective dimensions (Facione, 2006); Fair-mindedness (Paul, 1993); Intellectual

1990); Observing (Ennis, 1987; Norms of the subject (McPeck, 1981); Content knowledge of the subject (McPeck, 1981; Hare, 1999; Bloom, 1956; Reichenbach, 2001; Swartz, 2004); Particular ways of expression (Charnock, 2010; Cortazzi and Jin, 2010); Epistemology of the subject (McPeck, 1981; Paul, 1982; Ten Dam and Volman, 2004); Deep knowledge of oneself (Paul, 1981); Understanding the bigger picture (Paul, 1981); Content of moral beliefs and values (Burbules, 2004; Goldberg, Kingbury, Bowell and Howard, 2015; Lipman, 2003;		Verification skills (Hughes and Lavery, 2015)	empathy (Paul, 1993); Moral consciousness (Paul, 1993); Critical spirit (Siegel, 1990); Training to argue (Bensley and Haynes, 1995; Sanders, Wiseman and Gass, 1994; Alston, 2001; Yeh and Chen, 2005); Cultural experience (Atkinson, 1997); Adaptive rationality (Chan and Yan, 2008); Feelings associated with moral beliefs (Thayer-Bacon, 2001; Reichenbach, 2001; Lipman, 2003)

Drennan, 2010); Recalling and retaining memory (Halpern, 2014); Verification skills (Hughes and Lavery, 2015)			

Although this table cannot include all theories of CT proposed by Western scholars, it lists some important elements. In this thesis, I would like to take content of this table as the knowledge of CT in the West and compare this knowledge with the knowledge that had been talked and taught among Chinese educational decision makers, educators and students.

2.5 Conclusions

This chapter firstly reviews some KT studies and summarizes that in multiple KT activities, the knowledge will be transformed after it has been transferred, due to some influential factors, including background knowledge, culture, the decision maker and the access.

Secondly, this chapter present the factors that influence the transfer of CT into China, through reviewing the literature on background knowledge and culture related to CT in China and the West. Since contributory factors can be found in both Chinese and Western contexts, there is a need to investigate how Chinese policy makers, teachers and students adopt CT in practice, and clarify how their actions reflect the problem of promoting CT in China, instead of saying that CT conflicts with Chinese culture or CT is absent in Chinese history in general.

Thirdly, the most seminal theories as well as a few recent definitions of CT by Western scholars are reviewed . The elements of CT in their works can be subsumed into four aspects, namely the evidence, the reasoning process, the conclusion and the disposition.These four aspects are taken as the Western knowledge of CT in this thesis.

Chapter 3 A Review of Studies on Critical Thinking and Chinese Education

3.1 Introduction

Many important Chinese policy documents were released to support the internationalization of Chinese education since the proposing of the Open Up Policy in 1978 (Cai, 1999; Han, 1999; Feng, 1997). Since then, the Chinese education system has been radically reformed according to international standards in order to cultivate innovative graduates and catch up with Western education systems; as a result, in Chinese universities, teaching and assessment methods have been designed according to the Western model (Ryan, 2011; Abrami, Kirby and McFarlan, 2014). In this context, educators in both China and the West started to carry out research to find ways to improve Chinese students' CT.

Previous studies on CT and Chinese education have focused on discussing how the culture of China's Confucian heritage and some teaching methods have influenced Chinese students' CT. No study has investigated that Chinese students may have difficulties in understanding certain aspects of CT. Nevertheless, the understandings of CT by different people in China could be vague if no special attention is given to clarifying its meaning, considering the fact that even in the West, there have also been educators who problematises the notion of CT and discusses that CT should not be simply equated with a kind of good and rational thinking without clearly defining this concept (Allison, 2014; Brookfield, 2012).

This chapter is preceded by a section introducing educational changes that have taken place in China in relation to CT, especially the situation over the past five years. This chapter then presents two sections presenting previous studies on the relationship between CT and Chinese teaching methods and the relationship between CT and Chinese culture, followed by a section discussing the importance of clarifying the meaning of CT. As will be written about, clarifying the meaning of CT has received attention from Western educators and should also be paid attention to China.

Based on these reviews, it will be claimed at the end of this chapter that there needs to be a study which investigates CT in China from a KT perspective by comparing knowledge of CT in China with CT theories and instructions defined in the West to see how CT has been reinterpreted.

3.2 Educational changes in China in relation to critical thinking

Since Deng Xiaoping implemented the Opening Up Policy in 1978, the number of students and scholars going abroad and foreign experts being invited to teach in Chinese universities has been rapidly increasing (Chen and Huang, 2013). In 1985 the central government released the document of 'Chinese communist party central committee on the reform of the educational system' (中共中央关于教育体制改革的决定) emphases borrowing curricula design and teaching content from developed countries and gives more autonomy to universities in carrying out changes and experimental programmes. In 1993, the state council releases the document of 'The guidelines for the reform and development of education in China' (中华人民共和国教育改革和发展纲要) which again stressed and encouraged international educational cooperation.

Between 1995 and 2000, many important Chinese state conferences mentioned the strategic aim of developing innovative talents through education, such as the fifth Plenary Session of the 14th CPC Central Committee in 1995 and the 15th National People's Congress in 1997, (Cai, 1999; Han, 1999). In 1998, the National People's Congress released the 'Higher education law of the People's Republic of China' (中华人民共和国高等教育法) which stated that cultivating innovative talents was the main aim of Chinese HE. Because of these interventions by the Chinese government, after 2000, internationalization and cultivating innovative talents became more and more popular in Chinese universities and relevant reforms have been radically carried out (Ryan, 2011; Xiao, 2005; Wei, 2003).

Due to this trend of internationalization in Chinese HE, more and more Chinese students went to Western universities to study and in Chinese

universities the teaching and assessment methods have been reformed according to Western HE systems (Ryan, 2011). For example, Sun Yat-sen University's East-meets-West curriculum is trying imitate Western liberal education (Fischer, 2012). These reforms indicate that Chinese policy makers want to imitate the success of Western universities by providing their students access to Western education styles.

In the Western education system, making a strong argument and defending one's claims solidly are highly valued abilities (Lea and Street, 1998; Ramsden, 2003). Some Western researchers found that Chinese students tended to avoid debating in the classroom and make weaker arguments when they were presented with a statement containing fallacies, which indicated a lack in CT (Atkinson, 1997; Nisbett, 2004; Foster; 2008). Chinese educators also claimed that comparing to Western students, Chinese students generally had more difficulties in constructing their own ideas and daring to challenge authorities (Wan, 1998; Liu, 1998; Hu, 2002). Based on these findings, Chinese educators and policy makers seem to assume that introducing CT to Chinese students will enable them to become innovative and creative thinkers and entrepeneurs, and introducing CT into Chinese HE will help realizing the comparative success of Western HE.

In this context, educators in both China and the West started to ask why Chinese students appear to be worse in CT than Western students and began to carry out research to find ways to improve Chinese students' CT. Some educators proposed that Chinese students were generally worse in CT because CT is incompatible with Chinese culture, which advocates collectivism, conformity and respecting authority (Atkinson, 1997; Pennycook, 1996; Canagarajah, 2002; Wan, 1998; Liu, 1998; Hu, 2002). Some argued that Chinese students performed worse in CT because the teaching methods in Chinese classes were still rooted in the old education system (Tian and Graham, 2011; Cheng, 2000); in other words, educating innovative and creative students had become the aim, but the teaching method was not innovative and creative.

Over the last five years (2012-2017), discussions regarding CT education is becoming richer among Chinese educators as many of them are thinking reflectively about their own CT teaching. Chinese scholars have claimed that CT education should be more than teaching a set of rules about logic (Dong, 2013; Wu, 2013; Chen, 2014), but should also involve teaching content and activities that can promote the construction of students' morality and value system (Huang, 2013, Yang, 2013), students' comprehensive ability of analysing various types of information, solving problems and eventually making creative contributions in both natural science and social science, academic or non-academic areas (Qian, 2014; Li, and Zhang, 2015).

To achieve these goals, Chinese educators generally hold that a student-centered teaching method should be adopted to replace the traditional lecture-based teaching method. The changes of innovative teaching methods all take this student-centered change as a core philosophy. In particular, this core philosophy is explained as letting students decide the topic of their classes, discover their own questions, seek information, organise discussion and form multiple perspectives (Liu, 2015; Li, 2014; Chen, 2014). Many Chinese educators hold that these activities are better suited to engaging students with CT, as these teaching methods let students know how to think critically through experience instead of through remembering theories (Dong, 2014; Yu, 2013).

It should be noticed that the education system in China generally support the idea of '重点培养' (training with focuses), which means giving better resources to some outstanding students to help them become the elite graduates (Pretorius and Xue, 2003; Chan, 1999). This can be seen as an inequality of opportunity, especially when it comes to the questions of 'how to assess the outstanding students?' and 'who to decide who is the outstanding students?'. This issue is related to opening small size CT discussion classes. Small discussion classes are not usual in Chinese universities and opening such classes needs special efforts made by staffs or departments.

For example, at Peking University, opening small discussion classes belongs to a pilot program (试点) of the university and needs to be approved by relevant leaders of the university[1]. In this university, one small discussion course is associated with one large lecture-based course, just like the seminars following lectures in UK universities. The teacher of the large lecture-based course is the overall organiser of the whole course. Smaller discussion groups are expected to be taught by different famous scholars, such as academicians, scholars of the One Thousand People Plan, the Yangtze river scholars and winners of the National Science Fund for Distinguished Young Scholars (院士、千人计划学者、教学名师、长江学者、杰青基金获得者), unlike in UK universities, where the small discussion seminars are often lead by early career academic members, such as PhD students and post-doctors. During the fieldwork I had a conversation with the lecturer of the CT course who expressed regret for not being able to open small discussion classes due to limited resources. The CT course of Peking University did not join the pilot program that adopts small discussion classes, although this method is regarded as an advanced teaching method.

There are also other universities which had invited famous scholars for better cultivating CT, such as scholars with certain titles, Western experts or experts with experience in Western HE system. This approach was adopted by the 'Three Levels CT Training Curriculum' of Nanjing University. This the CT program appear to be the one that is highly valued by MOE according to the content and amount of the MOE texts praising this course. In chapter five, more CT courses opened by different universities will be introduced. It can be seen that many universities are making significant efforts to promote CT cultivation through inviting experts and providing resources. CT courses tend to be a type of course that has the potential of becoming a part of the kind of program that many Chinese universities are investing great sources to construct.

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[1] the original policy document can be found on the homepage of the university: http://dean.pku.edu.cn/notice/content.php?mc=61411&id=1385536247.

As for how to be approved to join such program, more complicated factors may need to be considered. In recent years issues about the hierarchy in China and the lack of fairness have been widely discussed (Postiglione, 2015; Zhao, 2014). Even though, it can be seen that inviting famous international scholars is a trend, as Chinese scholars of CT are celebrating this kind of program which generally receive great support from their universities.

This overview of recent developments has demonstrated that the kind of CT courses based on lectures, large classes and mainly teaching the rules of logic are beginning to be seen as less advanced by CT scholars in China. However, as will be shown in chapter five, the less advanced teaching method is still used to teach the majority of students in more universities, while the small size CT classes were only available to some 'elite students'. This obviously produces a problem of inequality, because in some universities, the students who are evaluated as the elite have the chance to develop their CT through experiencing discussion and problem-solving activities, practicing the analysis of advanced and emerging information, and communicating with famous scholars. This means much better opportunities for them to acquire knowledge and skills and build academic connections, compared with their peers.

It can be expected that in future, more and more universities will include CT courses in such reforming programs. Previous empirical studies on Chinese students' CT will be a fundamental base for designing such programs. As will be reviewed in the following two sections, many studies have studied how some teaching methods and styles can improve Chinese students' CT; some others have studied how Chinese culture influence students' educational context and made them generally less critical, in the sense of being able to question and think reflectively about certain beliefs.

3.3 Studies on the relationship between teaching methods and Chinese students' critical thinking

In the context of studying CT in Chinese HE, most scholars have focused on a 'deficit' that Chinese students are perceived to have and to find

methods to ‘fill’ this deficit with ‘better’ knowledge of CT, without taking into consideration the knowledge and training that Chinese students already have. In both China and the West, Chinese students’ difficulty in CT was noticed through their performances in classes of various subjects such as academic writing (Gunawardena and Petraki, 2014; Dwight, 1997; Durkin, 2008) and medical education (Haobin, Wipada, Areewan, Beverly, 2008; Albert, Albert, and Radsma, 2002). Seeing this lack of CT among Chinese students, education scholars in both China and the West have tried to find teaching methods that can improve Chinese students’ CT. The majority of these studies evaluate students’ progress in CT by certain tests, such as the California CT Disposition Inventory (CCTDI) and California CT Skills (CCTST). These studies use these tests to record Chinese students’ performance in CT before and after they had received certain training to discover the relationship between students’ CT and those teaching activities. In these studies Chinese students’ tests scores are used as an indicator to evaluate the effect of certain teaching methods. Below I discuss a couple of prototypical studies in detail and then present similar studies focusing on teaching methods, but in less detail.

For example, there is an article entitled ‘Improvement of Nursing Students' CT Skills through Problem-Based Learning in the People's Republic of China: A Quasi-Experimental Study’ (Haobin, Wipada, Areewan, Beverly, 2008). This is a quasi-experimental study that involves a pre-test/post-test design for two groups. Participants in the two groups are second year students at a nursing school. They took the California Critical Thinking Skills Test at the start and end of a semester. One group participated in a general nursing class while the other participated in a class based on clinical problem solving. This research found that students’ marks in the pre-test are of same level but those who received the problem solving classes got much higher marks in the post-test. The author therefore claims that teaching activities involving problem solving is beneficial for acquiring CT.

In another example, an article entitled “A Comparative Study of Critical Thinking Skills between English and Other Liberal Arts Majors” (Wen,

Wang, Wang, Zhao and Liu, 2010) investigates whether students who take English as their main subject acquire CT better than their peers who take other liberal arts as their main subjects. This was a nationally funded project that involved more than two thousand undergraduate students in China to do the CCTST test. Through comparing the scores of students in different subjects and different years, the researchers claim that English major students have an advantage in CT compared to those of other majors. Therefore, this study claims that learning English can be relevant to acquiring Western cultural values and skills such as CT.

The rest of these studies also use similar methodology which employs CT tests to discover relationship between students' performance in those tests and certain teaching methods, such as problem solving and English training. Most of the studies on testing CT of Chinese students are subject specific and the majority of those subjects are related to nursing and English language. Besides teaching activities of problem solving and English training, there are also other teaching methods which are found can contribute positively to better performance in CT tests. These teaching activities are regarded as advanced teaching methods, including: small group discussion (Dong, Anderson, Kim, and Li, 2008; Lian and He, 2013; Yang, 2007), practice case studies in the real world (Ozturk, Muslu, and Dicle, 2008; Ip, Lee, and Lee, etc, 2000) and reflective essay writing (Zhang and Lambert, 2008). Some teaching activities are found to have a negative influence on students' CT ability and these teaching methods are regarded as traditional teaching method in China, such as emphasising students' remembering of principles and concepts (Liang and Yuan, 2008) and lecture based teaching (Wangensteen, Johansson, Bjorkstrom and Nordstrom, 2010), as students who only had received these traditional teaching scored lower in CT tests.

In chapter five, I will present my research findings on which of these teaching methods of CT have been used in various Chinese universities through analysing publications of MOE. This does not provide insights into each of the use/application of such teaching methods, but provide an overview of how many Chinese students were being taught by these

methods (between 2003 to 2015). It was found that these advanced methods are only available to elite students and the mass students were still being taught by the traditional, lecture based methods. Reforming teaching methods may not be the only way to improve students' CT, and adding relevant knowledge points can also be helpful. Although how efficient that will be is uncertain, this is a very doable way to improve the way CT is taught as it requires the teachers to talk more about certain ideas, which is the strength of Chinese traditional education.

In brief, there have been studies that investigate relations between Chinese students' CT and certain teaching methods. These studies take Chinese students' CT scores as a variable and statistically analyse if there is a correlation between the increase of CT scores and training Chinese students in some specific ways. Following this research direction, a number of important teaching methods have been found to be effective for improving Chinese students' CT. However, a shortage of this kind of studies is that tests scores cannot fully reflect students' CT.

In fact, even in the West educators have been revising these CT tests and creating new tests in order to more accurately evaluate students' CT (Certed, 2001; Hatcher, 2011; Yeh, 2002; Floyd, 2011); not to mention there is still the problem of language and translation of these tests. Therefore, one gap of the literature is that there has not been a study that investigates Chinese students' CT in non-exam environment where the students can freely choose what topics they want to talk about.

3.4 Studies on the relationship between Chinese culture and Chinese students' critical thinking

There have also been many studies on CT and Chinese students discussing the relation between CT and Chinese culture. Some of these studies investigate the influence of Chinese culture on Chinese students' CT qualitatively by reviewing the related the literature and observing Chinese students' behavior in classes, while some other studies also use

quantitative analysis to discover the relation between CT tests scores and students' nationalities.

There are studies on the impact of Chinese culture through qualitative methods. These studies tend to claim that Chinese culture leads to Chinese students' difficulties with CT. These studies did not use tests scores to show how students of different cultures perform differently in CT. Instead, they analyse features of Chinese culture and Chinese students' behavior in Chinese or Western classroom. Based on the literature on Chinese culture, they examine how Chinese culture can shape Chinese students' way of thinking and acting, and how this constitutes hurdles for the acquisition of core CT skills. As culture has a significant effect on human behavior (Tseng, 2001; Fave, Massimini and Bassi, 2011; Pierce, 1972), it is logical to claim that the Chinese culture advocating collectivism and conformity (Atkinson, 1997; Ramanathan and Atkinson, 1999) leads to Chinese students' rarely proposing their own opinion in a classroom setting (Li and Liu, 2006; Tian and Graham, 2010; Tiwari, Avery and Lai, 2003; Jones, 2006), only being good at reciting what is told through lectures and textbooks but hardly thinking independently and constructing their own understanding (Chang, Mak, Li, Wu, Chen and Lu, 2011; Turner, 2006), and tending to make moderate arguments instead of strong arguments in presentation and writing (Durkin, 2008; Gunawardena and Petraki, 2014).

There are also quantitative studies investigating relations between Chinese culture and Chinese students' CT scores. Here I give a brief illustration of a study of this kind.

The study 'Culture and Context: Critical Thinking and Student Learning in Introductory Macroeconomics, Studies in Higher Education' (Jones, 2006) investigates different performances of Chinese-speaking students and English-speaking students in a macroeconomics class in an Australian university. This Introductory Macroeconomics module was not designed for improving students' CT particularly, so it does not measure how receiving certain teaching can improve students' CT, as all students in this class were taught in the same way, but how students of different culture

perform differently in a CT test called CALM (Critical and Analytical Learning in Macroeconomics), which is particularly designed for testing CT ability for the economics fields. The author records marks of randomly selected students across the semester to see if Chinese-speaking students' performances in this test are different from English-speaking students. It is found that despite their cultural background, Chinese-speaking students are not worse than the natives in this specific CT test called CALM; so Chinese culture is not found to be a barrier in students' acquiring CT in this study.

Consistent with this study, some studies also claim that Chinese culture does not have a negative influence on Chinese students when acquiring CT skills (Turner, 2006; Tian and Low, 2011). However, there are other studies studies which found that everything else being equal, having a Chinese cultural background correlates with lower scores in critical thinking disposition tests (Tiwari, Avery and Lai, 2003; Zhang, 2003; Chan, Ho and Ku, 2011). It seems educators, both in China and the West, have contradictory evidence about the impact of Chinese culture on students' CT ability.

In brief, those qualitative studies find that Chinese culture is responsible for how Chinese students perform in CT. These qualitative studies review elements of Chinese culture that hinder some elements of CT, such as challenging authority. However, in qualitative studies Chinese culture does not always correlate with lower scores in CT tests. What's more, with some learning experience, Chinese students can score highly in CT tests as well. These quantitative studies measure students' CT by tests.

In view of these two contradicatory claims, educators have proposed that multiple factors can influence Chinese students' CT performance so there needs to be a holistic approach to investigate how to evaluate students' CT. This holistic approach considers students' culture (in particularly, norms and value system), as well as their learning experience (in particularly, their habits of essay writing). This studies claims that neither the Chinese culture of traditional teaching methods are solely affecting Chinese

students' CT and Chinese students may also have difficulty because CT is a broad and vague concept (Tian and Graham, 2011). Some claim that Chinese students' CT may be as good as Western students but they just have different habits of using concepts and language in their writing, in particular using moderate words (Jing, 2011; Niedringhaus, 2001). Chinese students may disagree with something strongly even if they use moderate words. In China, people will understand that somebody is making a strong argument while at the same time being extremely polite. From a Western perspective the person making such an argument is however seen as lacking in confidence, because people in China and the West do not have a shared value system in this aspect (Niedringhaus, 2001). In this way, saying Chinese students have worse CT is just a stereotype.

However, language is itself a carrier of culture (Lin, 2015). The problem of language is a problem and a reflection of culture. One cannot blame the language instead of the culture as they are linked. It seems these studies are asking for more understanding towards Chinese habit of using language. It has also been proposed that renaming some concepts associated with CT will be helpful. For example, some articles have suggested that entitling CT as dialectical thinking would make it easier for students to engage with CT, as the word 'dialectical' does not conjure up meanings of 'criticising' and 'disagreeing' (Oda, 2010; Chiu and Cowan, 2011).

Nevertheless, this suggestion was not followed because of this similarity between the two concepts. After all, just because there are links between dialectical thinking and CT does not mean they are same concepts. In fact, Regina Ip Lau Suk-yee, who was the New Democratic President in Hong Kong, had suggested in 2008 to change the official translation of CT to highlight the content of dialectical thinking (this does not particularly refer to a type of dialectical thinking such as the Hegelian but a general and literal understanding of dialectical thinking) by re-translating CT as '明辨性思考' (discerning thinking) or '分辨性思考' (thinking resolution/distinguished thinking). However, both Chinese educators and Western educators who worked in Mainland China had argued that

translating CT as ‘批判性思维’(critical thinking) was better, not just because ‘批判’ (criticism) is the literal translation of ‘critical’ but also because it covers the concept defined by Western critical thinkers more accurately as CT does contain a sense of disagreeing, including the meaning of having different opinions and disapproving something, even though it is not limited to disagreeing (Wu, Z. 2011; Mair, 2014) and CT has still been still translated in the old way through the years. That is to say, dialectical thinking cannot and has not been used as a replacement of CT in China.

Therefore, renaming concepts associated with CT cannot solve the problem of CT in Chinese education. This means, changing the language used to describe CT may not solve Chinese students’ problems in engaging with CT. Better language skills can be helpful but that is different from changing the word or term for CT in Chinese.

Literature on CT education in China often claims that rote learning is the key problem that obstruct Chinese students’ CT, and rote learning is a tradition of Chinese education mainly due to the influence of Confucianism. However, more recent researches has started to recognize the value of traditional Chinese education. For example, Confucian education impart students to announce multiple voices by hiding multiple meanings in a few words or sentences; in this way one can avoid embarrassing situations in relationships which is a part of responsibility of thinking for others (Li and Wegerif, 2014; Tang, 2016). There is a Chinese idiom/saying called ‘一语双关’ (a word with double meanings) and an idiom/saying called ‘心知肚明’ (know something in heart, though may not speak so). Chinese traditions taught students to be euphemistic in expression but the thinking can also be deep. These two idioms can be seen as descriptions of this tradition. Exploring the wisdom of ancient and classical Chinese work may be a good feature to have in future CT courses. Besides explaining the spirit of CT in a way that is familiar to the students, Chinese classical works does contain lots of ideas that inspire people to think in a clear and reflective way. Due to limitation of length I can only illustrate a few sentences quoted from these classical works:

1. 物有本末，事有始终。知所先后，则近道矣。摘自《礼记·大学》

Translation: Every object has its essence and terminal. Everything has its start and end. By knowing which is the first and which is the latter, we are getting closer to knowing the law. Quoted from *Book of Rites·Great Learning*

The link with CT: the idea of this passage is similar to causation. It reminds people to pay attention to structure of facts and time of happenings and in this way to clarify the cause and effect.

2. 古之欲明明德于天下者，先治其国。欲治其国者，先齐其家；欲齐其家者，先修其身；欲修其身者，先正其心；欲正其心者，先诚其意；欲诚其意者，先致其知；致知在格物。摘自《礼记·大学》

Book of Rites·Great Learning

Translation: In ancient times, the individuals who intend to manifest the fairness morality to the world will govern their countries first. When they intend to govern their countries, they will manage their families first. When they intend to manage their families, they will regulate their life first. When they intend to regulate their life, they will correct their hearts first. When they intend to correct their hearts, they will build a sincere mind. When they intend to build a sincere mind, they will enrich their knowledge first. The key in enriching the knowledge depends on tracing the nature of phenomena.

The link to CT: the idea of this passage is similar to stating the ground of beliefs, which was emphasised by CT scholars such as Dewey. This passage reminds people to explore the source of knowings, clarifying why they adopted their beliefs, and therefore keeping the well-supported beliefs sincerely.

3.5 The importance of investigating the knowledge transfer of critical thinking

As reviewed above, teaching methods and Chinese culture have two focuses considered by educators who work on improving Chinese students' CT. Noticing that there is evidence about Chinese culture and previous learning experience having a negative influence on Chinese

students' engagement with CT, educators have started to explore a more holistic perspective by considering the impact of both teaching methods and culture. Through the holistic approach it was found that Chinese students' problems with CT may be related to language use. However, explaining CT using terms such as 'discerning thinking' or 'dialectical thinking' may make CT easier to be accepted in Chinese HE, but this way of explaining may also modify some elements of CT as it was defined by Western scholars. Also, more and more recent studies are emphasizing the positive effect of Chinese traditions on cultivating CT.

This problem of comparing understandings of CT in China and in the West has not been noticed. However, this problem should not be ignored, since CT is a concept that is difficult to understand and taught. When CT is transferred into Chinese HE, it can be expected that different understandings will be constructed.

Among Western CT scholars, clearly explaining the meaning of CT has been a concern. In recent years, there have been researchers of education who found that some university teachers cannot clearly describe what CT is, but advocate the notion that cultivating CT is the central goal of education (Allison, 2014; Brookfield, 2012). This is a problem that causally taking CT as a good way of thinking, ignoring the fact that among scholars of CT this way of describing CT is contested (Doddington, 2008). As reviewed in section 2.4, many Western scholars had proposed different definitions of CT. A core difference between their definitions is related to the transferability of CT.

Being able to recognise and accept alternative possibilities, according to McPeck (1981), to a large degree depends on the norms accepted in the subject area. That is to say, the norms adopted in a subject can limit people's imagination of other possibilities. And these norms are formed based on large amount of knowledge of the subject over time. For this reason, McPeck holds that CT can only be taught in combination with the subject area, as different traditions, rules and norms exists within different subject areas.

Many CT scholars seem to agree with McPeck that CT is not transferrable to other contexts (Byrne, 1994; Ten Dam and Volman, 2004; Pithers and Soden, 2000), developing CT must be accompanied by learning content knowledge of a subject (Hare, 1999) and knowledge is necessary for any higher-order thinking (Bloom, 1956; Reichenbach, 2001). For this reason educators have begun to design CT tests for students of different subjects and discussing if students coming from different cultural contexts, especially those from East Asia, apply different forms of CT as they adopt different traditions of expression, i.e. different forms of rigorous writing or speaking (Charnock, 2010; Cortazzi and Jin, 2010). All these claims tend to comply with the opinion that there are different forms of CT in different subjects and contexts.

However, Facione found a correlation between students' CT and GPA scores (Tian, 2008), which involves various disciplines. In a more recent work, Facione (2006) defined CT as a purposeful but not necessarily aggressive argument to help people make various kinds of good decisions, including ethically and morally good decisions, and that CT involves both cognitive skills and affective dispositional dimensions. Siegel (1990) also defines that CT is both 'subject-specific and subject-neutral'. Paul (1993) claims that CT involves certain human qualities that cannot easily be 'tested'. This also shows how the concept of CT is becoming gradually wider and more vague.

Ten Dam and Volman (2004) worked on finding out the pedagogical strategies for CT cultivation and they emphasised that CT was generally necessary for good citizenship, which similar to Dewey (1910) and Sumner's opinion (1906). Dam and Volman summarised some experimental studies which found that teaching methods of class discussion, giving presentation and writing tasks can foster students' CT. What also can foster CT includes studying in interdisciplinary courses, instructors' encouragement and feedback, and learning in history courses. However, they found that there was no empirical evidence that can guarantee the improvement of CT after using these teaching methods. The

results of those studies were not consistent; so the findings of improvement in CT could have come about by chance. They also found that most CT researchers think that CT cannot be transferred to other contexts, so CT should be taught in courses of the subject instead of in an independent CT course. Ten Dam and Volman also see that CT is an epistemology belief, which is constructed based on people's contexts of their subjects and real life situations.

As reviewed above, some scholars hold that CT involves epistemology that has to be built within particular contexts, so CT is a way of thinking based on specific principles. Some hold that CT is to challenge the established ideas and can be transferred across contexts, so CT is generally and broadly a good way of thinking. Some hold that CT involves a commitment of being fair and seeking the truth. Some hold that CT involves moral reasoning which reflects the core value system of a person. Some hold that CT is a practical ability for achieving purposes despite the ethical character of the purposes. All in all, there is not a common understanding of CT.

These different understandings of CT produce the problem of the transferability of CT, which has been discussed by scholars of CT in two ways. The first is about the possibility of transferring CT between different subjects. In other words, can a critical chemistry student, for example, think critically about political problems? Can this student use what he or she used to take as being critical in his or her study to analyse political problems? Will a good critical thinker in one subject be a good critical thinker in other subjects? This way of discussing the transferability of CT is also called the generalisability of CT.

The other way of discussing the transferability of CT is about the possibility of transferring CT between people, in particular, from teachers to students. The main difference between teaching content knowledge and teaching CT is that students will not only repeat what the teachers said. This raises an ironic problem which is that, strictly speaking, a teacher cannot 'teach' his or her students to be critical. The reason is that, if the

teacher tells a student that being critical is to reason in a specific way, then the student is following the teacher's way of thinking, which is the opposite of being critical. This way of discussing the transferability of CT is also called the teachability of CT.

These two ways of discussing the transferability of CT are actually interrelated, as they both involve the issue of different forms of CT. If some teachers are impressing the students to be critical in a particular way that the teachers take as being critical, this particular way of being critical should be related to these teachers' background, their subjects and their academic circles. So this is again the problem of transferring CT between different subjects and contexts. This kind of discussion actually leads to what can be seen as a core problem of cultivating CT----can teachers tell students how to be critical without taking away their freedom of thinking critically? Or, are students taught to be critical in a way that some teachers take it as being critical, a way that involving some principles and criteria ruled by experts of a discipline? In that case, students are actually taught to think in a strictly controlled way, instead of a sceptical, reflective and liberal way.

Regarding the transferability of CT, there is a need to review different understandings of CT. Especially when CT is being constructed in a different cultural and social context, the meaning of CT can be transformed. As a result, there is a need to investigate if some elements of CT, according to the content of some Western CT scholars' works, have not been adopted in Chinese HE, in addition to the existing literature on CT and Chinese education.

3.6 Conclusions

In this chapter, previous studies on CT and Chinese students have been reviewed. Overall, it is found that teaching methods and Chinese culture are the main focuses of studies in this area and it has been found that how CT is understood and constructed in China has not been studied before.

However, educators in the West had stressed the importance of clarifying what CT is, with a focus on the specific forms of CT adopted in different subjects, and not simply equate CT with a good way of thinking. What is more, according the KT studies reviewed in chapter two, the knowledge of CT is very likely to be transformed and changed in Chinese context. This transformation will apply to the 'content' of the knowledge that is being transferred, in this case Western scholars' approaches, theories and teaching methods of CT. This thesis will therefore examine the content of the transfer of CT from the West to China. The next chapter will present research methods used in this thesis.

Chapter Four The Research Design and Approach

4.1 Introduction

The literature review has demonstrated that research into CT in Chinese HE is mostly limited to investigating a perceived 'deficit' in Chinese students curriculum and thinking on the one hand and to trying to find methods to fill this deficit on the other. So far nobody has studied CT in the overall context of Chinese culture. This is what this thesis tries to do. Of course it can only do this in a focused and limited way, and in this thesis I choose to investigate this question through studying what knowledge of CT has been taught in China and if the knowledge is different from the CT knowledge in the West. The thesis adopts the KT framework to study how Western approaches, theories, methods ('knowledge') of CT are reconstructed when transferred to China, by policy makers, teachers and students. What parts of Western CT are seen as valuable and why; which aspects are taught and which not; and how do students think about the CT teaching.

CT has many facets and aspects, including knowledge about logical inferences, which can be taught almost through rote learning, but CT also refers to skills and dispositions. In this thesis the word 'knowledge' is used to refer to all these aspects of CT. The word 'content' is also used to refer to this multifaceted type of knowledge. The content of CT books and articles can be seen as knowledge of CT, so in this way the ideas of CT skills and disposition are both seen as elements of knowledge of CT in this thesis. This is not the usual meaning of skills or disposition, so here I want to explain again.

To know if the knowledge of CT in China is different from the knowledge of CT in the West, we need to know what the knowledge of CT in China is and what the knowledge of CT in the West is. In this thesis, the knowledge of CT in the West will be constructed by reviewing definitions of CT in seminal works written about CT, by Western scholars.

Once this overview of Western CT knowledge has been established, the thesis then goes onto investigate how it 'travels' to China and is transformed in China. Three points in this travel, transmission and transformation will be the focus of the thesis: it looks at why decision makers want to import CT into Chinese HE; it examines what aspects of Western CT Chinese students are being taught and what access they have to CT; and it explores how students talk about their experiences when learning CT.

KT studies distinguish between a source and recipient unit. In this case the 'source unit' is Western thinking about CT; the 'recipient unit' is three-folds: policy makers, teachers, student – who all deal with what the 'receive' in different ways.

In this thesis, I analyse data collected through the Chinese Ministry of Education (MOE), CT classes at Peking University and the schoolmate online community of Renren. These are of course not the whole knowledge of CT adopted in Chinese HE, but these are derived from conventional data and resources representing decision maker, teachers and learners.

This chapter will firstly present the research philosophy, the reasons for using a case study approach, and how data has been collected and analysed for each of the three sources of information, which respectively deals with MOE, CT classes and Renren. Lastly, the ethical review will be presented.

4.2 Considerations of ontology, epistemology and methodology

The method of social science research is closely tied to the researchers' viewpoint about what is the nature of social reality and how social reality should be examined (Bryman, 2008; Burr, 2003; Silverman, 2006; Gibbs, 2007). The reason is that the research method is supposed to achieve the aim of a research and the aim of a social research can always be seen as focusing on a kind of social reality. Hence, the viewpoint about what the

nature of social reality is determines what a research will intend to find about. Also, since the research method is supposed to produce knowledge about a social reality for one or a few disciplines, the viewpoint about what appropriate knowledge of social reality is determines how a social reality should be studied. Ontology and epistemology are the subjects in philosophy that discuss what the nature of social reality is and how can people know about a social reality properly (Bryman, 2008; Burr, 2003; Silverman, 2006; Gibbs, 2007). As a result, there is a need to present the ontological and epistemological orientation to clarify the nature and contribution of the research findings of social studies.

The aim of this research is to find out the CT knowledge adopted by MOE, CT classes and Chinese university students. The nature of the research findings is how CT is presented, taught, introduced and discussed by certain groups of Chinese people, their understanding of CT, the meanings they associate with CT and the ideas and aspects of CT that they are familiar with. The ontological position of this research is therefore constructionism, as this thesis intends to study the social reality of CT knowledge and this social reality is seen as being formed by various groups of Chinese people through talking and writing about CT. The CT knowledge in the West is also seen as being constructed by Western scholars through writing about CT in their works. Therefore, the nature of the social reality that is studied in this research is consistent with the constructionism which suggests that social reality is formed by social actors (Bryman, 2008; Burr, 2003).

As for epistemological position, this thesis adopts the aspect of interpretivism which suggests that social actions needs to be studied through interpreting the meanings that social actors' attribute to their actions (Gbrich, 2007; Bryman, 2008; Audi, 1999). This thesis holds that to know the social reality regarding adopting CT into Chinese HE, there is a need to study the meanings attributed to CT by relevant social actors in China. The understanding of CT is tied to the meanings people will

attribute to the action of thinking critically, so in this thesis what is hold as appropriate knowledge is consistent with the interpretivism.

This thesis also employs an assumption that some ideas of Western CT may be left out (backgrounded, ignored, de-emphasized) because the adoption of CT into Chinese HE parallels transferring knowledge from one organisation to another, but this assumption is only a general reference according to KT. The research focuses on observing emerging similarities and differences between meanings of CT in Chinese HE and Western scholars' writing. Chinese social actors may interpret CT in a specific way that makes the action of thinking critically appropriate for them. As will be shown in chapter six, this way to appropriate CT may be equating CT with logic and reasoning as in this way CT will not challenge the Chinese tradition of being polite..

Based on this nature of the research aim, an inductive approach is chosen as the methodological position in finding out the difference in CT content. An inductive approach generates theories from the data (Silverman, 2006; Gibbs, 2007). Although based on the KT studies, it is hypothesized that the knowledge of CT will be changed after this knowledge is transferred into Chinese HE, this says little about how the knowledge will be transformed. So in research I will not make record according to several variables but record the knowledge of CT in Chinese HE as it emerged and then generate the similarity and difference between the content of CT contained in Chinese people's texts and compare such content with the content of CT contained in Western scholars' works. As the transfer of CT is a new subject of KT, it is more appropriate to record phenomena as they emerge than make records according to fixed variables, because for studying a new subject, fixed variables are often inaccurate. Again, the research findings can be used to understand if some ideas commonly contained in Western scholars' writings are generally not adopted by Chinese students and are neglected by Chinese CT teaching, as commonly concerned by many KT studies.

The method of analysis is a mix of thematic analysis of various types of texts and some statistical analysis involving counting frequency, so both qualitative and quantitative methods are used in this research. Mixed methods are usually used in order to make the research result be more convincing by investigating both macro and micro levels and supply complementary data for what can be missed by the other method (Todd, Nerlich, McKeown and Clarke, 2004). Mainly, this research focuses on the understanding and the meanings associated to CT by certain groups of Chinese people. Therefore, the thematic analysis is used to analyse sentences in the texts or records, to gather an intensive finding of the texts mentioning CT. The analytical tool of NVivo is used for the thematic analysis. The thematic analysis is a kind of qualitative analysis (Bryman, 2008). The statistical counting of the times those meanings of CT have been mentioned for is taken as complementary data, and this complementary data is used to consider how often have the meanings been mentioned by larger population so that to some extent the findings can be applicable in other contexts beside the context in which this research was conducted. This consideration is similar to the external validity in qualitative studies which means findings of one sample can to certain extent represent other samples (Bryman, 2008).

4.3 The reasons for using the case study approach

The case study approach studies one or a few examples of a class of phenomena (Abercrombie, Hill and Turner, 1994). Compared with other frequently used research strategies, such as experiment, survey, archival analysis and history, a case study approach is suitable for studying complex and unexplored areas, in which the researchers can use different data sources to provide multiple angles of the research subject, and intensively observe the data as it emerges and generate many variables of interest, in depth insights and discover what they have not expected before (Yin, 1994; Earl, 2007; Stark, 2004; Berg, 2004). Because of these features, the case study approach is often found to be useful when studying social phenomena in naturally occurring settings and real life context (Yin, 1994; Bloor and Wood, 2006). What is more, since in depth insights of the research participants are expected, large amounts of data of the research

participants can be produced which later needs to be narrowed down. (Bryman, 2008; Yin, 1994).

This research makes use of the case study approach because it chooses to study CT in Chinese HE from a new perspective which is investigating the CT content (meanings and understanding) adopted by certain groups of Chinese people. Several previous studies have focused on testing CT while the content of CT remained unexplored This meant that one could not start with a given set of variables Therefore, this research proceeds inductively by collecting data as it emerges.

There are also criticisms in using a case study design. The major criticisms are a supposed lack of generalisability, which means findings of a case study can hardly be applicable to larger population (Yin, 2008; Bloor and Wood, 2006), and lack of rigor, which means lack of systematic procedure and objectivity (Yin, 2008; Berg, 2004). Concerning these criticisms, scholars of the case study have suggested that this approach focuses on "analytic generalisation" instead of "statistical generalisation", which means the research findings of a case study is to be generalized to a theory through solid logical inference instead of being generalized to a larger population (Yin, 2008), and that since the findings of a case study often involve the researchers' subjective interpretation of qualitative data, it is the readers' responsibility to decide if the context of this case study is applicable to their (the readers') contexts (Guba and Lincoln, 1989; Denscombe, 2007). In other words, it is legitimate that findings of a case study are context dependent.

In fact, the case study is not the only research approach facing the problem that the research finding is context dependent and involves researchers' subjective analysis. These problems exist in other approaches too. For example, categories and variables in quantitative studies are subjectively chosen by researchers and often the findings can only be applied to certain contexts (Flyvbjerg, 2006). Therefore, findings produced by a case study design are not less meaningful than findings produced by other approaches

though it involves researchers' subjective analysis and may be applicable to some readers' contexts and not applicable to others.

This research adopts the notion of "analytic generalisation" in that its findings may be generalized to a theory. Nevertheless, as a researcher I believe that it is my duty to gather the findings that are applicable to as more readers' contexts as possible. There may be both readers who find my research findings applicable and not applicable to their contexts. However, by using the mixed methods of observation and thematic analysis and through both methods the missing of same aspects of CT are found, it is more possible that the missing aspects identified by this research is also a problem of teaching content of other Chinese universities. In both the CT classes and the Renren posts, the CT aspect regarding logic and reasoning were emphasised while the aspects regarding uncertain conclusion and disposition and emotion are understated. The CT classes and the Renren posts are separate research sources. They do not have influence to each other yet they commonly reflect this missing content. A reasonable explanation is that generally the teaching of CT in Chinese universities does not involve these aspects and Chinese students' understanding of CT does not include this content either. Therefore, it is likely that missing aspects may be applicable to more than one CT modules, at least, one can say that there are Chinese students in many universities not knowing such aspects of CT. What is more, this missing aspects are theoretically useful for achieving the goals of MOE, as will be presented in chapter five, for which they value CT, which indicates that this content is both missed and needed.

For the criticism of lacking rigor, standards and systematic procedures in a case study approach, it has been argued that some case studies are actually designed to set standards by shedding light on the 'more general characteristics of the societies in question', so it is hard to set standards for those case studies which look for standards themselves (Flyvbjerg, 2006, p.14). These cases are called the paradigmatic cases. There are some questions that have not been asked before or some social phenomena that have not been studied in certain ways. As a result, there needs to be

someone who gathers various types of amounts of information surrounding this question to understand more general conditions so researchers in the future can design standards accordingly. In other words, researchers need to know more about what to expect about a question to decide what standards and procedures to follow. In this way, lacking standards at the beginning of data collection seems understandable for such paradigmatic cases, as the data will be sorted and analyzed after it is collected.

Nevertheless, one cannot say that he or she wants to study a new question so he or she does not need standards or systematic procedures in research. It is just that this kind of case study can have their own ways to collect and analyse data, and their ways do not have to be same with existing standards or procedures. What is more, the ways of research used by this kind of case study need to be accepted as rigorous to others. It has been claimed that the success of a case study relies on a rigorous theoretical frame demonstrating data collection, analysing and result reporting (Dark, Shanks and Broadbent, 1998). This includes clarifying what data will be sampled and collected, how they will be analysed and what result can be expected based on the analysis to answer the research question.

Since the previous literature has not studied CT in Chinese HE in a way that examines Chinese social actors and their understanding of CT, this thesis can be seen as a paradigmatic/novel case since this thesis intends to find out more general characteristics of this question, the transfer of CT, and set standards and directions for future researches of this question. For example, the research findings of this thesis imply more specific aims for future researches, such as how to be neutral and consider multiple viewpoints are difficulties needing particular efforts in teaching. These directions would not be predicted before this research.

Based on the KT literature I have identified three categories of social actors for my study: 1. The managers or directors who make the decision of transferring the knowledge.. 2. The classes, programs or activities through which the transferred knowledge is adopted. 3. The learners who

are supposed to adopt the knowledge. Their performance after adopting the knowledge is often used to evaluate the success of KT. This project studies these three types of actors to adopt new knowledge respectively. The MOE plays a very directing role in China's HE. It can be seen as the decision maker for promoting CT, as a Western educational philosophy, in the Chinese HE system. The CT classes at Peking University can be seen as one fairly typical site where CT is taught. .

4.4 The design of data collection and analysing methods

In this section I will outline the process of data collection and analysis. I will focus on three sources of evidence which respectively focus on the following questions: 1. How is CT being presented by publications of the Ministry of Education? 2. How is CT being taught at Chinese universities? 3. How is CT being discussed on internet fora by university students The following sections will present how the process of data collection and analysis was conducted.

4.4.1 The research design for studying attitudes of decision makers of Chinese higher education

The literature review regarding KT in chapter two shows that managers or directors who make the decision of transferring certain knowledge to their units play an important role in the KT process. Decision makers' values and interests are crucial to understand how the process of KT is organized. They decide the building of transferring access (Kogut and Zander, 1993), how much time, costs and efforts to invest (Teece, 1981) and to a large degree decide the preferred way of the transfer process (Kogut and Zander, 1993). Therefore, the values of the decision makers are an important factor in influencing the success of KT. The interests/values are what motivate the study of the organisation (Rao and Pasmore, 1989; Wang, 2008). Decision makers may emphasise the transfer of the elements that are particularly important for reaching their preferred results (Kogut and Zander, 1993). They may also delete or modify the part of knowledge that is in conflict with their value system or norms (Kostova, 1999). In sum, studying what the decision makers value

about the knowledge and what they do for promoting the KT are important for investigating what knowledge is transferred to the recipient unit.

There are decision makers of KT on various levels. The university leaders are decision makers of the university and the lecturers are decision makers of their modules. When it comes to transferring knowledge of CT into the whole Chinese HE system, the Ministry of Education (MOE) plays the role of decision maker.. The MOE has a crucial position in managing and directing education, including higher education, in China. The mission of the MOE includes “To draw up strategies, policies and plans for educational reform and development”, “To organise and guide international educational exchanges and cooperation” and “To direct the development and reform of higher education”. These points make it quite clear that MOE plays a role of decision maker in various educational activities including transferring Western educational approaches such as CT, into the Chinese higher education system.

Based on the KT theories and the mission of MOE, this first case of this PhD project analyses publications on the official website of MOE that mention the phrase “critical thinking” (批判性思维). Since the publications on official websites of governments are what the governments authorized, appointed and approved (Zhang, 2002), it is expected that publications mentioning CT reflect the attitude of MOE about the introduction of CT into Chinese HE. Following KT insights, special attention is given to find out why MOE value education of CT (what is the educational interests) and what strategies they use to promoting education of CT (what efforts have been done). This case study contributes to the main research question----CT content adopted into Chinese HE----by investigating what the decision makers have done to promoting this transferring. In addition, the presentations by MOE also make texts mentioning CT available to those who read it. As a result, MOE itself can also be a medium of transferring by the informational content it published.

A limitation of this study is that these publications on MOE's official website may not reflect how officials understand CT but only how they talk about it officially. However, according to analysts of political discourses, political discourses can be taken as political behaviour (Fairclough and Fairclough, 2012), as political policies are there to guide actions, in this case of teachers and students.In this way, making publications talking about CT is a type of behavior. This data can be used for analysing what politicians in MOE has done for supporting CT education.

While policy makers devise policies to guide other people's actions, but they also engage in self-presentation; in this case they want to be seen as innovative and creative leaders. According to Goffman's self-presentation theory, one's presentation is often made for a purpose of leading others' impression (Smith, 2006), so what the speakers say may not reflect the speakers' understanding but what the speakers want to make the listeners understand. That is to say, what is published by MOE may not reflect the writers' understanding of CT but what the writers want the readers to understand about CT. In this way, MOE is also giving informational content of CT to their readers who can be students or scholars of CT.

The source of the first set of data is the official website of the Ministry of Education of People's Republic of China. The data of this case study is directly downloaded. I searched for the Chinese term "critical thinking" (批判性思维) on this official website. By 25 March 2015, there are 80 search results, with one duplicates and three not talking about CT in HE. Within the rest 79 texts, three texts are on education in high school and primary school. Since this project is interested in education of CT in Chinese higher education, these three texts were excluded. Therefore, in total the search yielded 76 texts which were all analysed. These 76 texts include five official policy documents. The rest are reports of educational activities, such as an educational plan or curriculum, interview and speech transcripts of officers working for MOE and articles written by professors in Chinese universities. Although these texts are files of different types,

they are all approved by MOE. Therefore, they can all be taken to reflect the position of MOE.

4.4.2 The research design for a case study of the critical thinking module at Peking University

Universities are one of the most important sources for students to gain knowledge and understanding (Gasset, 1946). This case study explores what knowledge of CT is being conveyed, through teaching content and actions, in a CT module opened by Peking University.

Established in 1898, Peking University is the first public university in China (Yue and Zhu, 2009). In modern times, Peking University is frequently evaluated as one of the top universities in China in education quality (QS World University Rankings, 2013). Peking University is one of the universities that is sponsored firstly by the Project 985, which is a project sponsored by the Chinese government for building top world-class universities in China (Yue and Zhu, 2009), and Peking University is one of the 9 universities (C9 League) that are chosen to be sponsored in the first phase of Project 985 (Yue and Zhu, 2009). As Peking University is a university that is involved in China's top national educational plans, it can be expected that generally modules in this university represent an advanced level in China. This background of Peking University is only one of the reasons for choosing CT class in Peking University as the place to conduct this case study. Another reason is its longest history indicates a stronger cultural context, and this research is based on the hypothesis that Chinese culture may change CT content. A stronger cultural context accumulated by longer history may make the change more obvious to be observed.

The most important reason for which Peking University is chosen as the research site is not just its rank and history but the particular condition of this CT module. Generally, all the modules of Peking University are of advanced level, but this CT module is not being advanced by being different from other CT modules opened by other universities. According to the characteristics found, this CT class is typical comparing to classes

in other universities. By being typical I mean the characteristics such as school that open this class, class size, students and lecturers' background. A table exhibiting these characteristics of this and other CT modules in various universities can be found in chapter five. Another C9 university that open a CT module is Tsinghua University, which is apparently not typical in form as it is opened in the School of Economics and Management, and taught by a lecturer with background of Business Strategy and Policy, while most universities that open CT classes in Philosophy Schools and are taught by lecturers with backgrounds in logic and/or philosophy. This thesis regards the university classes as the access and chooses this CT module at Peking University to represent the access for the whole Chinese HE, so the case should be as representative as possible. This is concerned by considering the typicality of the form. The general advanced level of this CT module as one of the modules of Peking University ensures the seriousness of this module.

Considering the quality of modules of Peking University, its history and culture, and the typicality of this CT module, this class is chosen to represent how CT is taught in Chinese universities. Certainly, this class is not totally same as the other CT classes in other Chinese universities. Content recorded in this CT module cannot fully represent teaching content in Chinese universities. This is a limitation of this case study. However, according to the information available, the majority of Chinese university students have been taught in this form of module. In this sense, this CT module can better represent teaching content in Chinese universities than other modules.

The data of this case study was collected by conducting participant-observation in classes of this CT module. There are three frequently used data collection methods in case studies: interviews, observation and collecting existing documents (Marshall and Rossman, 2010). Comparing with the method of collecting documents, through interview and observation the researcher can have better control over the reliability and suitability of the data, as the researcher can produce their own data and does not have to choose from what already existed (Denscombe, 2007).

Since previous studies focus on the teaching method instead of teaching content, I choose to produce my own data through participate observation. Certainly there is an element of subjectivity so it depends on the readers to decide if my description of the teaching content is suitable to their teaching content.

Compared to the method of interview, observation has the potential to reach the 'naturalistic enquiry' of what is being studied (Bryman, 2012; Bloor and Wood, 2006) and form a more total understanding of the situation (Baker, 2006; Aull, 2008; Tedlock, 2003). The naturalistic enquiry means trying to study how something is like in everyday life. Interviews can disrupt the normal flow of actions of the subjects[2] (Atkinson, Coffey and Delamont, 2001). Also, an interview must not be too long (usually should not be longer than an hour), otherwise the participant may feel tired and bored (Seidman, 1998; Bryman, 2012). Therefore, if the lecturer is asked what content of CT will be taught, it is almost impossible to expect that the answer is complete as there are too many items to talk about. In addition, in many cases the subjects are found to be reluctant to talk about some culturally sensitive topics in an interview context (Baker, 2006). As CT does have conflicts with some parts of Chinese culture, this sensitiveness in an interview is likely to occur. To avoid the disadvantage that the subjects may hide some facts because the topics are sensitive, interviews are more problematic than observation.

Through observation, the researcher gets involved in the field for a longer time, and therefore has better opportunity to gain an intimate knowledge of the field, and how the subjects act in real life. Therefore, what is found through observation better reflects the natural situation of the subject. Last but not the least, during an observation the researcher may discover new interesting questions which have not been asked before (Blaikie, 2010), while in semi-structured interviews the subjects generally try answer questions posed by the interviewer. In observation, however, the researcher is not only relying on others' answer but their own seeing and hearing.

The method of observation also has disadvantages. First of all, this method is time consuming. Secondly, during observation the researcher has a chance to develop new questions but can also easily deviate from the original research question and lose the focus. Interviews, on the other hand, usually cost less time than observations and are more efficient in answering the original research questions, as the questionnaire is designed to answer these questions (Bryman, 2012). Considering the advantage and disadvantages, observations are suitable for researches that are interested in describing a research site as complete as possible (Bryman, 2012).

This PhD project is interested in finding out how CT is being taught in a university module and what aspects of Western CT are foregrounded and backgrounded in the process. To gain an overview of the what type of CT is taught and how, observation is a suitable method, as interviews would only elicit specify answers to specific questions, questions that some participants might not want to answer, or a variety of reasons, either personal or political.

Researchers generally distinguish between participant observation and non-participant observation (Bryman, 2012). During participant observation the researcher immerses him/herself in a group of people for certain time, to observe their behaviors and listen to their talks, including conversations between this group of people and the researcher (Walliman, 2011).

During non-participant observation, also called simple observation, the researcher does not join in any of the activities but only listens and observes an outsider (ibid). The advantage of participant observation is that it lets researcher study the situation of the field from the subjects' perspective (Walliman, 2011). In this way the researcher can know what the subjects would know and need to know, and therefore have a more exhaustive sense about the situation (Baker, 2006; Aull, 2008; Bloor and Wood, 2006). It is expected that by observing as a participant, the researcher can understand meaning of behaviours that is attributed to the environment (Walliman, 2011) and the status of knowledge in the context

(Bloor and Wood, 2006). The advantage of non-participant is that as the researcher does not interrupt events of the group, he or she has less influence to the environment (Bryman, 2012).

The aim of this project is to understand how CT is presented in natural (class room) settings, so it is important to minimize my influence on the classes. While joining in the classes and observing through the students' perspective is important for knowing what the students will learn. To balance these two needs, I participated only by doing the assignment and examination but not interrupt any in class activities. It turns out that doing the assignment and examination are the main events besides listening to the lecturer, who did almost all the talking. Participant observations vary in the extent to which the researcher participant in activities of the subjects (Bryman, 2012). Doing the assignment and examination are the extent to which I participate in this class. Participating the examination and assignment doing may be important for me to know what the students would learn, as it has been claimed that these activities of earning credits draw lots of attention among Chinese students (Hannum and Cherng, 2011; Qiang, 2008).

During the lectures, I sat in the classroom like other students and took notes. The notes include keywords and phrases (Bryman, 2012) about what I thought were important points in the lecture. These notes were then developed into field notes, on the same day after a lecture took place. This is because on the day of observing the researcher usually remembers what is happening clearer (Bryman, 2012). Re-reading of the field notes are frequently down while write up the research results. These field notes include complete sentences as well as my interpretation and explanation of the records. I also had two personal communications with the lecturer before the participant observation started and after it ended. My full researcher status was revealed to the lecturer.

To avoid deviating from the research questions and collecting too much useless data (Aull, 2008), there are some questions that I always kept in mind while doing this fieldwork (participant observation): What

knowledge being taught is and what the content is (I draw attention to the theme of knowledge and how the lecturer explain to students); what the definition is; what the importance of CT is; what the strategies to improve students' CT are; what about Chinese culture/tradition/pre-existed knowledge is said?

According to Chapter two the literature review, different cultures may influence the body of the knowledge (Osterloh and Fey, 2000; Tsai, 2001; Gupta and Goviudarajan, 2000; Kostova, 1999; Szulanski, 1996). Due to different cultural systems, the learners may be not encouragred to adopt what does not fit into their value system (Simonin, 1999; Berbegal, Lafuenta and Sole, 2013) and the content that is not consistent with the the norms could even be cut off (Kostova, 1999; Szulanski, 1996). Therefore, I also paid attention to the mentioning (or not) in this class about how CT conflicts with Chinese traditional culture. Due to lack of familiarity and pre-existing knowledge, the transferred knowledge may be harder for the recipient to be understood/absorp (Testa, 2012; Tsai, 2001; Chen and McQueen, 2013). Hence, I paid attention to how the lecturer describes CT and how he tried to make it easier to be understood by the students.

In sum, data of this case study is my field notes made in CT classes at Peking University. Here the university classes can be seen as a source for learning CT, or a channel in KT process which enable the students to access the CT content. The data of this case study is collected by conducting participant-observation. I tried to adopt the students' perspective. The method of participant observation is usually used to record as much as possible about what is being studied and prepared to receive surprising discover (Bryman, 2012). This tradition of participant observation is adopted in this case study. I listened to the lectures, read the lecture slides and textbook, finished the assignments as the students, and written field notes based on participating these activities in total. The records were made surrounding the core research question which is how CT is taught in these classes. Some sub questions of this case study had been kept in mind before started the observation, so that relevant data can be collected through participant-observing the class.

4.4.3 The research design for studying students' knowledge of critical thinking through internet

The third site of research looks at a social media platform and explores how Chinese university students understand CT. I did this by analysing their discussions regarding CT on a schoolmate network (Renren website). I collected data from students' posts mentioning CT (批判性思维) on the website of Renren and performed a thematic analysis of selected posts.

Renren is a social network with millions of users (Qiu, Lin and Leung, 2013) the users of this network are required to register on this website with real names and names of their universities. It firstly was only accessible by IP addresses in Universities. This setting was to ensure that most of the users are university students, which are the target users of the creators of this website (ibid). Since 2009, access to Renren was extended and IP addresses outside universities were allowed to log on. However, the users are continuously required to register with the name of their schools so the network on Renren is still built between schoolmates. According to researches of *China Internet Network Information Centre* (CNNIC) and Renren itself, after 2009 the majority of users are still university students and graduates (Sina, 2013; Chinanews, 2010).

Thanks to the information above, it can be expected that most posts on Renren are written by university students in China. As those discussions mention CT are part of posts on Renren, it can be generally said that these discussions about CT are among Chinese university students. As a result, these posts can be used for analysing what some students in HE say about this idea and which aspects of CT they most frequently discuss about. The research results therefore can shed light on Chinese university students' understanding of CT and which aspects of CT they are mostly interested in.

Of course, this cannot fully reflect how all Chinese university students think about CT, as there can be students who have opinions regarding CT but they do not post on Renren. However, considering the fact that Renren

is one of the most popular internet tools among university students in China, it can reflect opinions regarding CT shared among the students instead of in front of teachers or in exams. The students may talk about some of their difficulties to their peers but not to their teachers. In this way, this case study can shed light to Chinese students' difficulties in CT which had not been noticed before. It is also possible that students will learn from their daily communication and casual discussions with peers, which are also common sources for learning (Kolb, 1984; Yackel, Cobb and Wood, 1991; Lackey, 2008). This thesis adopts the method of document analysis because these documents were produced without knowing will be analysed later (Bryman, 2012).

In sum, data of this case study is collected by searching for the term CT on the Renren website and download the searching results. There are 891 posts on Renren that mention CT which were written between October 2ed 2009 to June 20th 2015. Most of the posts only contain a couple of sentences and only a few of them are long posts. Considering the amount and length of the posts, analysed the full sentences of the posts by thematic analysis was chosen.

4.5 Ethical considerations

Publications on the official website of MOE and posts on Renren website are both public and none of them are password protected. Therefore, they are public domain documents (University of Nottingham, 2012). Even so, all names of these writers have been anonymised for better protection of their identity.

Before doing the participant observation at Peking University, I have obtained ethical approval from the School of Sociology and Social Policy at the University of Nottingham. To protect the right of any human subject involved in this research, this thesis will not release details which could identity individual participants to anyone other than my supervisors and examiners, and the CT lecturer was told about my identify, contact details and nature of the research purpose. For the classroom observation I submitted a informed consent form and received from the School of

Philosophy of Peking University and the lecturer of the CT module (see appendix 3.1.).

4.6 Summary

This chapter introduces the research method of the thesis. The philosophy of this research is rooted in a constructivism, interpretivism and an inductive approach. The reason is that these methods are suited for research that tries to understand how Chinese people, in particular those involved in HE, understand CT and what meanings they attribute to CT. KT was used as a reference to select three sources for this researchers but no variable of interest was set before doing this research.

My thesis investigates three sites, investigating relevant social actors and their practices regarding CT. This provided three sources of information for my case study. The MOE is focused on directing valuing CT in Chinese education system, while the university is focused on the aspect of teaching knowledge to students and the Renren posts better represent what knowledge of CT is discussed in by Chinese students. Thematic analysis has been used to analyse texts and talk collected through three sources of information, including the records collected through the class observation, so each text involved has been analysed qualitatively. The times the meanings associated to CT got mentioned in MOE texts and Renren posts are counted so a bit of quantitative method is used. How CT is taught in Chinese university is studied by a case study. Only one CT module is studied. As a result, there is a need to consider if the research findings of this case study is applicable to other contexts. Since people who written those MOE documents and Renren posts were of various backgrounds and studied at different universities, they can be taken as the complementary data to consider the external validity of the research findings of the whole thesis.

Chapter 5 Research Findings Based on Documents Released by the Decision-making Authority of Chinese Education

5.1 Introduction

This chapter presents research findings gathered through analyzing the documents released by MOE, which represents the decision making authority of Chinese education. The HE law of China published in 1998 gives Chinese universities more freedom to design their curricula, to do research, and to build links with other organisations (Qian and Verhoeven, 2004), but the central planning has not gone away. Politicians always make clear in educational policies and laws that the autonomy of Chinese universities is under the national principles and plans (Guo, 1995). So the activities of universities must be consistent and contribute to the national educational plans. The government still has the right, for example, to decide how much graduates are needed in certain areas and can deny the universities' request of the number of enrollment (Yang, Vidovich and Currie, 2007). The government's policies can also lead the universities to radically expand their enrollment to accept mass students (Yang and Gale, 2004) or raise some programs focusing on a smaller number of elite students in elite universities to compete at a world level (Zha and Hayhoe, 2015). In this way, the government still plays the role of decision maker in the sense of deciding what kind of talents are valued and what are the overall expectations attached to HE.

According to the mission statement on its official website, the Ministry of Education (MOE) of People's Republic of China has the rights and responsibilities "to formulate the curriculum catalogues and documents for the guidance of teaching; to examine and verify, in collaboration with relevant departments, the establishment, renaming, abolishment and adjustment of higher education institutions; to undertake the implementation and coordination of Project 211 and Project 985; to direct and coordinate all forms of higher education and continuing education; and to provide guidance for the improvement of the assessment of the higher education" (MOE.GOV.CN). From this mission statement, it can also be seen that the MOE is taking care of various aspects of education,

from curriculum teaching to institutional establishment. Therefore, though the MOE does not directly control the universities, it is supervising the universities quite substantially. In this context, the educational ideals promoted by the MOE must be consistent with the ideals and actions of the universities.

According to the KT theory, the goals and actions promoted by the decision maker shape the knowledge in the recipient unit and have influence on how the individual learners can get access to the knowledge. The documents mentioning CT released by MOE embody the concern of government for CT education. The reasons why the MOE values CT and actions supported by the MOE reflect the aspirations of the MOE and such aspirations have an overall impact on what ideas of CT have been accepted in Chinese HE. What is more, these reasons and actions influence how Chinese students adopt CT.

This chapter studies the ideals, overall goals and educational activities promoted by the MOE through analysing the public information released on its official website. The purpose of this official website is to convey educational information to the public (MOE.GOV.CN). Therefore, what is stated by documents published on this website reflects the attitudes and actions that the MOE wants to make public. This analysis involves 76 documents mentioning the term CT (these documents were collected before and on 25 March 2015).

By reviewing those documents mentioning CT, this chapter will present reasons for which CT has been valued by the MOE, and module and curricula opened for cultivating CT. The reasons for which CT has been valued can be seen as the goals the MOE wants to achieve by cultivating CT, and the modules and curricula can be seen as actions supported by the MOE. These policy documents set the parameters for what type of knowledge of CT is introduced in Chinese HE, how it is taught and how it is learned. It also shapes the way that teachers and students may value CT themselves.

The following sections will firstly present an overview of the textual data, followed by illustrating the CT modules and curricula opened in Chinese universities and then how the value of CT has been emphasised by these texts published by the MOE. The history of CT being valued in Chinese HE will also be explored.

5.2 An overview of the documents analysed in this chapter

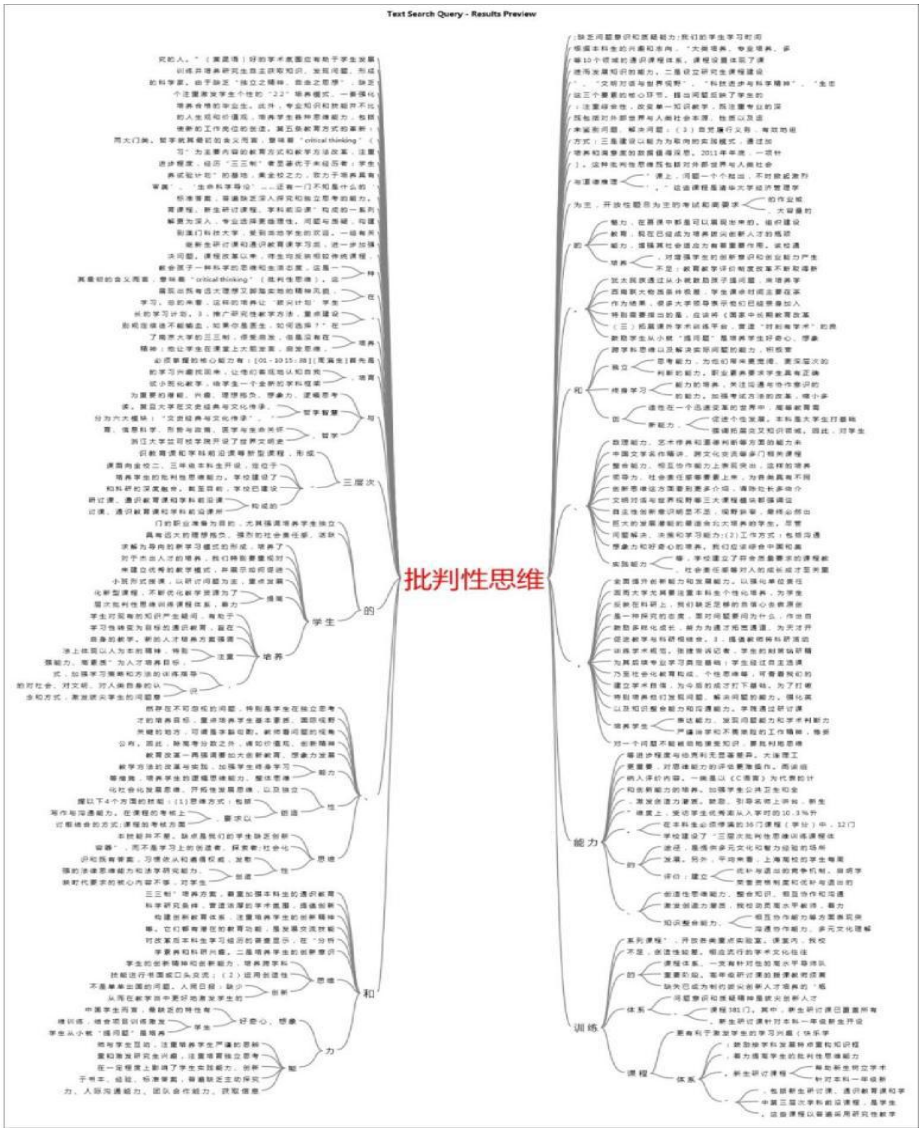
By searching for the term 'critical thinking' (批判性思维) on the official website of the MOE, there were 80 search results (the documents were collected on 25 March 2015). The picture below is the screenshot of the search results:



Among the 80 search results, one document is a repetition of another text and 3 documents deal with high schools or primary schools (their titles are: 建立中小学生学业质量的绿色评价系统; 绿色评价"体检"中小学教育; 中美交流高中科学教育). These texts generally state the importance of CT and indicate that CT is what Chinese education should learn from Western education, particularly the United States. This number implies that CT in HE is the main concern of the MOE, compared to CT in other levels of education. As this project only studies CT in Chinese HE, these texts were excluded. In total, 76 texts were

included in the analysis. These 76 texts include 5 policy documents, 9 speeches or interviews of officers working for the MOE and 62 articles reporting curriculum information or teaching principles written by leaders or professors in universities or editors working for the MOE or Chinese state media.

To get an overall understanding of the context in which CT is mentioned, NVivo was used to produce a word tree. The branches of this tree show which 20 Chinese words appear before and after 'critical thinking' (批判性思维) in those 76 texts. By comparing with the total frequency of mentioning CT, the counts of words appearing near CT can shed light on how CT is generally talked about. The table following the word tree demonstrates the times of appearing near CT of these words:



Words appearing near CT	Times
‘curriculum/module/class’ (课)	83
‘ability’ (能力)	82
‘student’ (学生)	73
‘cultivation’ (培养)	51
‘thinking’ (思考+思想+思辨)	33+6+1+1=41
‘education’ (教学+教育)	22+28=40
‘creativity/innovation’ (创新+创造)	23+15=38

As can be seen, some words have been mentioned more frequently near the term ‘CT’ than other words. Words mentioned most frequently include ‘curriculum’ (课), ‘ability’ (能力), ‘student’ (学生), ‘cultivation’ (培 养), ‘training’ (训 练), ‘creativity/innovation’ (创 新 +创 造), etc. These frequencies provide an indication for which themes are discussed in these documents. I shall discuss these themes in the qualitative part of this chapter, using thematic analysis.

The total frequency of mentioning CT is 96 and the frequency of the term ‘curriculum’ appearing close is 83. CT is mentioned together with ‘curriculum’ most of the time. Based on these frequencies, it can be expected that emphasising CT is not only a slogan or motto but an action carried on in Chinese university curricula. Therefore, the university curricula of CT is a direction to look into. The word frequency of the term ‘ability’ is 82, so this term is mentioned together with CT most of the time too. CT is both a type of skill and value. This frequency indicates that Chinese policy makers and educators tend to focus on the skill aspect of CT instead of the value aspect. What is more, ‘creativity’ and ‘innovation’ were talked about as correlates of CT for 38 times, more then a third of the total frequency of CT. As stated in the reviewing of the development of Chinese HE in chapter three, cultivating innovative graduates is a core ideal of Chinese HE. The frequency of ‘innovation/creation’ indicates that some Chinese policy makers and educators had seen a link between CT and this core goal. In brief, these frequencies indicate three themes of these documents: ‘changes in curricula’, ‘training abilities’ and

‘creativity/innovation’, which sort of highlight three steps in adopting CT in Chinese HE: changing the curricula, finding new ways of training students’ CT ability, and these are done for an expectation that these will lead to development in creativity and innovation.

Based on repeatedly reading these texts, how various universities had been trying to develop CT and why CT is valued can be investigated, including what is said about the relationship between creativity/innovation and CT and summarize the process of adopting of CT into Chinese HE in a chronological order.

5.3 Actions for cultivating critical thinking

As found in the analysis in last section, the MOE supported quite a few Chinese universities to open modules entitled as CT and curricula concerning cultivating CT as the core mission. These can be seen as actions done by the MOE for promoting CT development. This section will introduce these modules and curricula one by one. The introductions regarding each module or curriculum below are based on information in both the 76 texts published by the MOE and information published on the homepages of those universities. After I identified the names of those universities through the MOE texts, I also looked for information of the CT modules or curricula through the homepages of the universities. The information on the university homepages was collected through searching for the term “critical thinking *class” (批判性思维*课) through the tool of Google advanced search. According to the search function explanation of Google, this means searching for all the texts containing the exact term “批判性思维 (critical thinking)” and “课 (class)” published on the homepage of a university (for example, the homepage of Peking University is ‘www.pku.edu.cn’).

The critical thinking module offered by Peking University

Two texts published by the MOE mention that Peking University had emphasised admitting students with CT. These texts are as follows (for

making the reading easier, I have highlighted those words that directly provide information for analysis):

北大首次明确新型"招生观" (published on 2013-07-23):

北京大学2013年高招录取工作日前结束。今年该校在招生工作中最突出的特点是:...二是要招收具有远大的理想抱负、强烈的社会责任感、活跃的批判性思维、巨大的发展潜能的最适合北大培养的学生。

Translation: The enrollment of Peking University in 2013 has finished recently. This year, the most obvious feature in the university's enrolling work is ...secondly, to enroll students who are most suitable for Peking University's cultivation, who have great ambition, strong social responsibility, active CT and huge potential.

高校自主选拔录取改革试点工作会议交流发言汇编, (published on 2013-03-31):

自从2003年开始试点以来，北京大学按照教育部相关政策要求，遵循人才选拔与成长规律，立足于"为国家和民族培养具有国际视野的、在各领域起引领作用的领军人才"的目标，深化改革，稳步实施，逐步探索出了一条符合高等教育发展规律、与北大人才培养、学科建设相适应的拔尖创新人才选拔新道路，招收了一大批学科特长突出、具备创新潜质的优秀学生，不仅提升了生源的多样性，也为学校进一步提高人才培养质量奠定了良好的基础。...改革评价标准和考试形式...把考查重点转向对学生长远发展更为重要的潜能、兴趣、理想抱负、想象力、逻辑思考与批判性思维、领导力、社会责任感等要素上来.

Translation: Since the pilot in 2003, Peking University has been deepening the reform and carrying it on stably to explore a road of selecting top talents who are suitable for Peking University's cultivation and subjects construction, according to the relevant policy of MOE, the law of talents selecting and cultivation, based on the goal of cultivating leading talents with international scope in various areas. A large amount of students with specialty in subjects and great innovative potential has been enrolled. This has improved the diversity of the recruits, and built a good base for further improvement of the quality of talents cultivation. ...the standard of evaluation and ways to test are reformed...the key in evaluation is turned to what is more important for students' longer development, including their interests, ambition, imagination, logical thinking and CT, leading ability and social responsibility.

As can be seen in the texts and the highlighted words, the university prefers to admit students who demonstrated CT skills. Whether this is a fair

standard or not, it shows that CT is emphasised by this university, alongside imagination and logical thinking.

Knowing that CT is emphasised by Peking University, I searched on the homepage of Peking University and found that a module entitled as "Logic and Critical Thinking" had been opened by the Philosophy School. This module is one of the general elective modules (通识课), which means it is open to all the students of the university and is not compulsory. All the general elective modules of Peking Universities are divided into 6 areas and this CT module belongs to the area of psychology and philosophy (see the classification of their elective modules including this CT module in appendix 1.1). By reviewing all the general education modules listed on the homepage of Peking University (see the list of conditions of their elective modules through 2003 to spring 2016 in appendix 1.2), it was found that the module entitled "Logic and Critical Thinking" has been appearing on their module timetable since the autumn semester of 2003. What is interesting is that it was also in 2003 that Peking University started to emphasise admitting students with good CT (see the highlighted sentences above), so these two events are related.

Peking University was permitted by the MOE to have some autonomy in administration (meaning this university can enroll a certain number of freshmen independently to the MOE) since that year, 2003. This autonomy is also an experimental reform according to Western administration model, which shows that emphasising CT is a part of Chinese HE's learning from the West.

This module firstly enrolled 100 students, and after 2007 the number of students doubled and became 180-210. The increasing number indicates the popularity of this module among the students. The lecturer since 2003 was Gu Zhenyi and since 2009 the lecturer has been Liu Zhuanghu. Both Gu and Liu are professors in philosophy and they are co-authors of a textbook on CT, which is used in this module.

The critical thinking module of Tsinghua University

There is a MOE report on the experimental/pilot reform of undergraduate education at the School of Economics and Management of Tsinghua University. The report shows that they opened a module entitled as "CT and Moral Reasoning". The text is as follows:

培育学生自由生长的"土壤"——清华大学经济管理学院试点本科教育改革纪实 (published on 2012-04-24):

"本以为学经济就是每天跟经济学理论打交道。"拿到课表，2011 级学生董俊芳感到有些意外，"'中文沟通'、'艺术与审美'、'生命科学导论'……还有一门不知是什么的'批判性思维与道德推理'。"

Translation: "I thought to study economics is to deal with economic theories everyday" a student said she was surprised when she received her module schedule, "there are Chinese Communication, Arts and Aesthetic, Introduction to Life Science and a module I do not know what it is, CT and Moral Reasoning".

According to the homepage of Tsinghua University, this CT module is not an elective one but a compulsory one for all the students enrolled in the School of Economics and Management in the second semester of their sophomore year (see appendix 1.3). This module was opened in 2003 (same with Peking University) and involved 60 students (see appendix 1.4). This module adopts a teaching method of Socratic problem probing, and since 2012 this module has started to involve both lectures in large size class and discussions in smaller size class (see appendix 1.4). This module has been taught by Yang Bin who is a professor in business strategy and policies, and Yang's research interests are businesses and society, leadership theory and practices, business morality, etc (see appendix 1.5). Yang said in an interview published on the homepage of Tsinghua University that he hoped there can be more teachers so this module can be divided into 10 to 20 smaller size classes (see appendix 1.6). This information indicates a wish of this CT teacher to divide the class into smaller ones so more discussions can take place between teachers and students.

The critical thinking curriculum offered by Fudan University

A MOE text mentions that a curriculum entitled as "Wisdom of Philosophy and Critical Thinking" has been opened by Fudan University.

This is an extract from this report:

大学通识教育论坛在复旦大学举行(published on 2008-06-18):
复旦大学近年来在本科生中全面推行通识教育,把通识教育作为素质教育改革的重要步骤。学校高度重视核心课程在通识教育中的基础性地位,在推进核心课程建设方面采取了一系列措施。
…
在研究论证的基础上,把通识教育课程体系分为六大模块:"文史经典与文化传承"、"哲学智慧与批判性思维"、"文明对话与世界视野"、"科技进步与科学精神"、"生态环境与生命关怀"、"艺术创作与审美体验"。
Translation: Fudan University has been promoting liberal education for undergraduates in recent years. Liberal education is taken as the key step in the reform of quality education. The university highly values the fundamental importance of core modules in liberal education, and is doing a series of actions in promoting the construction of core modules. ...

Based on studying and reasoning, modules in the liberal education system are classified into six parts: 'Classics of Literacy and History', 'Wisdom of Philosophy and Critical Thinking', 'Dialogues of Cultivation and the World Horizon', 'Science Improvement and Scientific Spirit', 'The Ecological Environment and Caring of Life', 'The Artistic Creation and Aesthetic Experience'.

As can be seen, this curriculum involves not only a single module but a series of modules, which means this university offers CT teaching differently to other units. Searching on the homepage of Fudan University, it was found that the part of 'Wisdom of Philosophy and Critical Thinking' of this university includes modules teaching classics of Chinese philosophy, Western philosophy and religious philosophy (see appendix 1.7). This curriculum appears to equate CT with the wisdom in philosophy and hold that CT can be cultivated through teaching philosophy. The purpose of designing this 'Wisdom of Philosophy and Critical Thinking' curriculum is to have the students understand Western and Chinese thinking, which is fundamentally important for developing CT.

These modules are provided by the School of Philosophy, open to all students of the university and involve around 100 students per module (Fudan.edu.cn). Although it is hoped that the students' CT can be cultivated through teaching these philosophies, no information on this university's homepage shows that they had opened a module with the title of CT. Yet by searching on baidu (a Chinese searching engine similar to Google), a lecture slide is found (see appendix 1.8) which indicates that this university also opened a module called 'logic and CT' and this module is taught by an associate professor of philosophy. This university does not only 'import' Western CT but teaches CT in the broader context of Chinese culture.

The critical thinking module offered by Huazhong Science and Technology University

There is a MOE report shows how a pilot educational plan has been carried out at the School of Qiming of Huazhong Science and Technology University. A part of this plan is to emphasise cultivating the students' CT. The following is extracted from this report:

华中科技大学设实验区培养拔尖创新人才 (published on 2009-05-05) :

学校为启明学院创新人才培养建立了一系列新机制。...注重学生领导能力、主动实践能力、人际沟通能力、团队合作能力、获取信息能力和批判性思维能力的评价；建立荣誉资格制度和优补与退出的竞争机制。

Translation: The university has constructed a series of new systems for the Qiming School to cultivate innovative talents...(including)... emphasising the evaluation of students' leadership ability, active practical ability, communicating ability, team-working ability,information acquiring ability and CT; an honor qualification system and an competition system are built (meaning joining these systems is an honor and students need to compete for it).

According to the homepage of this university, a module entitled as "Critical Thinking" was opened in 2008 but was only offered to the students of the subject of electronic information in Qiming School and these students were enrolled in a special experimental class named "种子班"/seed class (see appendix 1.9). It is commonly known in China that this is the kind of class designed for elite students. This module has been taught by Canadian

professor Dong Yu who had received his doctoral degree at the Philosophy Department of the McMaster University in Canada (China Youth News/中国青年报, 2011). The textbook used for this CT module is also written by Dong (see appendix 1.10). It seems in this and many other universities the lecturers write their own CT textbooks. This module was taught in both English and Chinese language in 2008; but in 2012 the syllabus published on the homepage presented that this module would only be taught in Chinese language (see appendix 1.10). It seems teaching in English language is still not widely done, perhaps it is too challenging for the Chinese university students.

I have reviewed all the module lists published on the homepage of this university and found that the only other CT module is one entitled as "Critical Thinking and Writing", which has been opened for undergraduates who want to pass the TOEFL, IELTS and/or GRE exams in order to study abroad. This module enrolls 40 students and is taught by a lecturer from the School of Foreign Languages (see appendix 1.11).
On the homepage of Huazhong University of Science and Technology, I found a piece of news reporting on a workshop named 'Building Critical Thinking modules' that is held at Huazhong University once a year since 2011. In the third workshop in 2013, there were a few other universities who sent delegates to give presentations in this workshop. Since the presentations of these universities directly reflect their interests in opening CT modules, I also searched on the homepages of these universities to discover more CT modules.

The critical thinking module offered by Renmin University

Renmin University has opened a module entitled as "Logic and Critical Thinking" (see appendix 1.12). This module is opened by the department of logic of the School of Philosophy and is available as an elective module to all students of the university (see appendix 1.12). It is also a popular and regularly opened elective module (see also appendix 1.12). This module enrolls 60 students (see appendix 1.13). The lecturer Yang Wujin is a professor in philosophy (see appendix 1.14). He has also written a textbook on CT which has been used in this module (see appendix 1.15).

This module has been filmed and published online. Some comments online are saying that this module is very interesting but too abstract to understand (see appendix 1.15). This information implies that there is a need to make this CT module more understandable and accessible to the students. The same problem has been written about by students in different universities on Renren, which I will analyse in chapter seven. Therefore, the need of making CT modules more understandable to students may be not only of the Renmin University but of many other universities too. In chapter seven I will show in more detail how and why Chinese students think their CT modules are hard to understand.

The critical thinking module offered by China University of Political Science and Law

The module entitled as "Critical Thoughts" has been opened by the Department of Philosophy of the School of Humanity and Social Science of the China University of Political Science and Law (see appendix 1.16). The module is taught by Zhu Sumei whose research interest is in logic (see appendix 1.17). Since 2013, the class size has been increased to 200 students (see appendix 1.18). It has not been revealed how many students were enrolled in this module before 2013, but since the class size was increased, this indicates an increasing popularity of this module, too.

The critical thinking curriculum offered by Nanjing University

13 MOE texts mention the "Three Levels Critical Thinking Training Curriculum (三层次批判性思维训练课程体系)". In this section I will only present some of these texts that contain information about this curriculum, because the other texts are mainly repeating the same information. This curriculum involves not a single module but a series of modules. It is named as "Three Levels" because this curriculum involves three types of modules which are the discussion modules for the freshmen, the general education modules and the modules teaching emerging and advanced knowledge for students in senior years. Until 2014, there had been 159 discussion modules, 77 general education modules and 128 modules on emerging and advanced knowledge. This information is summarized based on the following Chinese text:

“三三制”拔尖人才培养模式改革与探索 (published on 2014-04-04)

学校建设了“三层次批判性思维训练课程体系”，包括新生研讨课、通识教育课和学科前沿课等三种新型课程，各类课程优先向拔尖学生开放。通过新生研讨课，帮助新生树立学术旨趣，学会质疑、学会发现，完成适应性转换和学术性转换；通过通识教育课，开阔学生学术视野，培养文化通感和科学精神，促进其形成独立的人格和价值观；通过学科前沿课，带领学生认识学术新领域、新发现、新方法，能够自主提出问题、分析问题和解决问题。目前，我校已开设有新生研讨课 159 门、通识教育课 77 门、学科前沿课 129 门。

Translation: the university build the “Three Levels Critical Thinking Training Curriculum” including the discussion modules, the general education modules and the advanced knowledge modules. The top students have priority in taking these modules. Through the freshmen discussion modules, the university intends to help students build their interests, learn how to question and discover, and change a habit of studying and get used to university life; through the general education modules, the university intends to broaden the students’ horizon, cultivate their cross-cultural understanding and scientific spirit, and promote their independent personality and value system; through the advanced knowledge modules, the university intends to guide the students to understand emerging areas, new discoveries, new research methods and let them be able to question, analyze and solve problems independently. Until now (2014), the university has offered 159 discussion modules, 77 general education modules and 128 advanced knowledge modules.

These modules cover multiple subjects and are opened by multiple schools; the university had also invited lecturers from other universities to teach in this curriculum; this three level curriculum has been carried on since 2009. Since 2012, Nanjing University has started to open discussion modules for the senior year students who had taken the general discussion modules and the general education modules. These senior discussion modules are regarded as the final level in this curriculum. The mission of this level appears to be linked with developing innovative talents. This information is summarized based on the following text:

多元化手段 个性化发展 (published on 2012-03-21)

第一层次的新生研讨课程针对本科一年级刚进校的新生开设，由知名教授主讲，...2009 年以来，全校新生研讨课在建项目总计 137 门，...两年多来，选修新生研讨课的学生约 5940 人次，在这些学生中，约 2/3 人次选择了非本院系所

开设的新生研讨课，...第二层次的通识教育课程...为了拓展课程资源，弥补我校在某些学科领域力量相对薄弱，我们积极引进校外优秀师资，...结合大量的跨院系开放选课，绝大多数本科生"足不出院系"，便能接受跨学科、跨专业的教育。...本学期，学校启动了全新的高年级研讨课申报工作。高年级研讨课面向全校二、三年级本科生开设，定位于"三层次批判性思维训练课程体系"中第三层次学科前沿课程，是学生继新生研讨课和通识教育课学习后，进一步加强批判性思维训练的重要阶段。高年级研讨课的授课教师须兼备较高的研究性教学水平和较好的科研能力，通过研究性、探究式、互动式的教学，使学生深化对某一学科专业领域的认识，进一步激发其探索与研究的兴趣，启发科学思维，提高实践与创新能力。

Translation: The freshmen discussion modules are offered to first year students. These modules are taught by famous professors...Since 2009 (until 2012) 137 discussion modules had been constructed. ...In the past more than two years, 5,940 students had studied in these discussion modules and among these students, about 2/3 of them selected modules offered by other schools (instead of their own schools). ...For the liberal education modules, outstanding teachers had been invited from other universities in order to teach subjects that were weakness of the university. ...Many cross-disciplinary modules had been opened so the students can have cross-disciplinary and cross-subject education...Since this semester (2012), teachers can apply to the university to establish the advanced knowledge modules. The advanced knowledge modules are offered to the second and third year students. Establishing these modules is an important stage as they further strengthen the students' CT after they had learnt in the discussion modules and the liberal education modules. Teachers of the senior discussion modules need to be proficient in both teaching and researching as they need to inspire the students to further explore develop a specific area and develop scientific thinking, practical and innovative abilities through researching, exploring and communication.

In addition, the classes of this curriculum are of smaller size, enrolling 10-30 students, as can be seen from the following text:

拓宽学生个性化成才通道 (published on 2013-05-01):

新生研讨课...每班 15 至 30 人，...学科前沿课由具有深厚学术造诣和活跃学术思想的教师开课，每班 10 至 15 人。

Translation: the freshmen discussion modules enrolled 15 to 30 students in each class, ...the advanced knowledge modules were taught by teachers with rich knowledge and active academic thinking, and enroll 10 to 15 students in each class.

Searching on the homepage of Nanjing University, it is found that modules involved in this "Three Levels CT Training Curriculum" are categorized as the freshmen discussion modules, the general education modules, the senior discussion modules and the modules on finding employment and entrepreneurship opportunities (see appendix 1.19). It seems the freshmen discussion modules are in the first level, the general education modules are in the second level and the senior discussion modules and the employment and entrepreneurship opportunities module are both in the third level. This CT curriculum is very special since it does not only focus on logic and philosophy but adopts the teaching method of discussion, which is generally seen as advanced, as reviewed in chapter three.

By looking through the modules listed, it can be seen that there is not a single module entitled as CT, though these modules are entitled as three levels CT training in conjunction. Also, until January 2016, there is only one senior discussion module which is on the atmospheric sciences, which implies that this curriculum was not fully constructed yet as the third level module was very few, so this university may need to open up more senior discussion modules in the future. According to information on the homepage, the senior discussion modules of this CT curriculum emphasise teaching in small size classes and aim at developing students' CT and deeper exploration in an area (see appendix 1.20).

The critical thinking module offered by the China Youth University of Political Studies

This CT module was opened in 2003. The lecturer Gu Zhenzhi has a Master degree in Philosophy and he is a professor in the School of Chinese Language and Literature of the China Youth University of Political Studies (see appendix 1.21). In 2012, Gu's module, entitled "The Rational Mind and Critical Thinking", was evaluated as an excellent module by the MOE (see appendix 1.22). This module is an elective module (not compulsory) to all students of the university and enrolls around 200 students (see appendix 1.23).

The critical thinking module offered by Nankai University

The module entitled as "Logic and Critical Thinking" is offered by the School of Philosophy and taught by Zhang Xiaomang. He is a professor whose research interest is in logic (see appendix 1.24). This module is open to all students of the university as an elective module (see appendix 1.25).

An overview of the critical thinking modules or curricula

The sections above present information about CT modules and curricula opened in various Chinese universities. The form below provides an overview of the aspects of these CT modules:

University	School	Size	Open to	Lecturers' area
Peking University	Philosophy	100-200	All students (not compulsory)	Philosophy
Tsinghua University	Economics and Management	60	Students in the School of Economics and Management (compulsory)	Business
Fudan University	Philosophy	100	All students (compulsory)	Philosophy
Huazhong University of Science and Technology	Qiming	20s	Selected students (NA)	Philosophy
Renmin University	Philosophy	60	All students (not compulsory)	Philosophy
China University of Political Science and Law	Philosophy	200	All students (not compulsory)	Logic
Nanjing University	Multiple Schools	10-30	Selected students (not compulsory)	Multiple
China Youth University of Political Studies	Chinese Language and Literature	200	All students (not compulsory)	Logic
Nankai University	Philosophy	NA	All students (not compulsory)	Logic

As can be seen, most CT modules and curricula are elective modules, are open to all students of the university, and are taught by lecturers whose background is in logic and philosophy. Therefore, those CT modules taught by philosophy school lecturers as elective modules to all students are typical cases, while those taught by lectures of other background to a small class of students are special.

As this thesis is interested in how CT has been taught to most Chinese students, I chose one of the typical CT modules, which is provided by Peking University, to observe what is taught. It is hoped that this CT module can represent the other modules to some extent, though not completely. There are universities who open CT modules very different from these typical modules, such as Fudan University and Nanjing University. As this thesis aims to find out how knowledge of CT is mainly constructed in the whole Chinese HE, a typical module is more appropriate than a special one. The universities and CT modules are all that were mentioned by MOE. They represent the advanced CT education in China, though they may not be all the CT modules opened in Chinese universities.

The valuing of critical thinking by Chinese key universities

It is worth noting that most of the universities that open CT modules or curricula are key Chinese universities, which indicates that emphasising CT is a part of the Chinese educational plan of building world-class elite universities (Zha and Hayhoe, 2015). Opening these CT modules or curricula is a reflection of these key universities' emphasis on CT. In China, the national key universities are those involved in Project 985, C9 and/or 211. These projects are initiated and funded by the Chinese government aiming at building about 100 universities that are not only first-class in China but also in the world (China Education Centre, Ltd; World Education News and Reviews, 2010). Project 985 has two phases. The C9 League is a group of Chinese universities which are sponsored in the first phase of Project 985. This league was expected to be China's equivalence to the Ivy League in the United States or the Russell Group in the United Kingdom (Yue and Zhu, 2009). Overall, Chinese

universities that involved in Project 985 and 211 and C9 League are those receive funds from the Government for improving their quality and win in the international educational competition. The table below introduces the universities' memberships of Project 211 and 985 or C9 League:

Universities open CT modules or curricula	Project 211	Project 985	C9 League
Peking University	X	X	X
Tsinghua University	X	X	X
Fudan University	X	X	X
Huazhong University of Science and Technology	X	X	
Renmin University	X	X	
ChinaUniversity of Science and Law	X		
Nanjing University	X	X	X
China Youth University Political Studies			
Nankai University	X	X	

This table above shows all the universities whose CT modules were mentioned by MOE. As can be seen, CT modules and curricula have been opened in quite a few national key universities in China.

Beside the universities which open CT modules or curricula, in the MOE texts, some other universities' valuing of CT has also been mentioned, though these universities did not report that they had opened a CT module. The texts and the translation of relevant quotes from the MOE texts are as follows:

	Title and time	*Quotes from the texts*
1	*各地各高校积极推进人才培养改革着力提高人才培养质量* *Published on 2013-06-13*	*山东大学、南京大学等充分发挥学科综合优势，开发一批高质量通识核心课程供学生选修，强化经典与前沿知识学习，培养批判性、创造性思维。改进教学方法。北京大学、东北大学、四川大学等实施小班化、研究性、启发式、批判式讨论教学。* *Shandong University, Nanjing University and some others had been using their advantage of having*

		comprehensive subjects to develop a series of high quality liberal education modules for their students to select. These modules emphasise combining the classical and advanced knowledge, cultivating CT and innovative thinking. Their ways of teaching had been improved. Peking University, Dongbei University, Sichuan University and some others had been carrying out the teaching methods of smaller classes, researching, inspiring and critical discussion.
2	*华东师范大学实施研究生创新能力提升计划有效推进研究生教育创新发展* *Published on 2009-07-03*	*在授课方式上，积极推进教学改革，提倡讨论式、互动式、案例式教学，注重训练并培养研究生自主获取知识、发现问题、形成批判性思维进而发展知识的能力。* *East China Normal University had been actively reforming its teaching method and promoting discussion, communication and case studies in teaching. The university had been emphasising training and cultivating postgraduates' abilities of studying and discovering problems independently, CT, and subsequently creating knowledge.*
3	*上海交通大学三项举措建设创新人才培养"特区"* *Published on 2010-10-18*	*三、以先进的模式培育创新人才* *二是培养学生的创新意识和批判性思维，以及知识整合能力和沟通能力。学院通过研讨课、报告会等方式，把能力培养贯穿教学全过程。作为教学特色之一，学院每学期都开设 2 学分由杰出教授主持的讨论课程。交大校长张杰院士以及一批海内外杰出教授都在讨论课上与学生交流。* *Shanghai Jiaotong University had been using advanced teaching methods to cultivate innovative talents in its Zhiyuan School. One of the methods is to cultivate students' cognition of innovation and CT, as well as the ability of synthesizing knowledge and communication. Zhiyuan school had been emphasising cultivating ability in the whole process of teaching, through the methods of discussion and presentation. As a feature, the school will offer a two-*

		credits module every semester. This module had been teaching by famous professors. In discussion modules, Chinese and foreign professors, including the president of the university academician Zhangjie, will communicate with the students.
4	*西安交通大学实施新版本科培养方案 全面拓展学生自主发展空间 Published on 2011-02-16*	*该校在本科培养中首次推行通识类核心课程，使每位学生不仅能受到特定领域的专精学术训练，而且还能受到广博知识的通识教育。通识教育是新的本科培养的一个重要组成部分，其通识类核心课程对提高学生综合素养，扩大学生的知识面，帮助学生养成健康的心理，树立正确的人生观和价值观，培养学生各种思维能力，包括批判性思维的能力，增强其社会适应力有着重要作用。* *Xian Jiaotong University had started to carry out liberal education modules among undergraduates to make all the students learn not only professional knowledge but also receive liberal education. Liberal education is a crucial part in undergraduate education. Relevant core modules are important for improving students' comprehensive quality, broadening students' horizon, helping students build healthy minds and correct value systems, cultivating thinking abilities including CT, and strengthening their social abilities.*
5	*浙江大学全方位开展本科生培养体制改革 Published on 2013-02-18*	*课程定位方面强调学习经典与前沿知识，培养批判性和创造性思维;课程教学模式方面采用大班理论授课和小班课堂研讨相结合的方式;课程的考核方面，要求以创造性、批判性思维为主，开放性题目为主的考试和高要求、大容量的作业或当场练习、现场演讲相结合的考核办法。* *Zhejiang university had been carrying out an institutional reform in undergraduate education. In modules learning classical knowledge and advanced knowledge are emphasised in order to cultivate CT and innovative thinking. In the aspect of teaching method, lecture-based teaching in large-size classes*

		and discussion-based teaching in small-size classes are both used. In assessment, innovative and critical thinking were emphasised according to the requirement of the university. The exams mainly included open-end questions and there were also large amount of demanding assignment or in class exercise or presentations.

As can be seen, these universities commonly express that they intend to use the teaching strategy of discussion to cultivate CT and they see emphasising CT as a change of their old teaching method. These universities did not report that they had opened a CT module but they expressed how they valued CT in the MOE texts. Again, these universities are the national key universities. The table below shows these universities' memberships of Project 211 and 985 or C9 League:

Universities	Project 211	Projec t 985	C9 League
East China Normal University	X	X	
Shanghai Jiaotong University	X	X	X
Shandong University	X	X	
Xi'an Jiaotong University	X	X	X
Zhejiang University	X	X	X
Dongbei University	X	X	
Sichuan University	X	X	

Searching on the homepages of these universities, it has not been found that a module or curriculum entitled as CT has been opened in these universities but these universities have been emphasising cultivating CT in their other modules. Entitling a module or curriculum indicates more focus on CT and mentioning valuing CT in general on the MOE texts are both a reflection of emphasising CT.

The table above again shows that CT has become an issue of wider concern in Chinese HE. This finding supports the claim of some studies on the internationalization of education which holds that many Asian

education systems have adopted the Western, particularly the American, assessment method and therefore are increasingly focusing on cultivating creative thinking and CT (Ngok, 2006; Mok, 2007).

Above I have shown how many Chinese key universities have been influenced by this emphasising on CT. In chapter six, I will analyse the mode of teaching in one of the typical CT modules in more details to shed light on how exactly these CT modules are by a case study approach.

5.4 The reason for which critical thinking is valued

According to MOE's mission statement, this official website of the MOE is a portal through which decisions made by the MOE are revealed to the public. Therefore, texts published on this official website are a reflection of the MOE's position. The forms in appendix 1.26 to 1.28 exhibit the paragraphs mentioning the reasons for which CT is valued. Through a thematic analysis of these documents and reviewing themes of these documents, one can gain some insights into why the MOE began to value and promote CT in Chinese HE. There are three main explicitly stated reasons.

The first reason for which CT is valued is improving students' capacity to engage in independent learning. There are 11 MOE texts which directly link CT with Chinese traditional and indigenous education by stating that a lack of CT is the result of shortcomings in Chinese traditional teaching methods (see appendix 1.26). To illustrate and translate some quotes of this kind:

1. 九三学社上海高校八基层第39次联席会议在复旦大学举行, published on 2008-06-18

在我国教育改革中，由于受传统教育思想的影响，缺乏相应的高校教师培训，高校的教学改革相当滞后。...这在一定程度上影响了学生实践能力、创新能力和批判性思维能力的发展。

Translation: In our country's education reform, due to the influence of traditional educational thoughts, relevant training for HE teachers is lacking and the reform in

teaching in universities is lagging... This to some extent influences the development of students' practice ability, innovative ability and CT.

2. 对培养一流拔尖创新人才的思考, published on 2012-10-10

儒家文化一贯倡导尊重师长，服膺四书五经的教导，崇拜孔子、孟子等圣人的权威，读书人做学问大抵是诠释圣人的话；怀疑以至推翻圣人的论断，则被认为"大逆不道"。另一方面，受到前苏联体制的影响，很长一段时间内还增加"领导代表真理"的舆论，并要求学生"听话出活"，"做一颗永不生锈的螺丝钉"。在这种文化和体制的影响下，青年学生的科学批判精神受到抑制，大多数人从娃娃开始逐步养成了崇拜权威的心态和迷信书本的习惯。

Translation: Confucian culture used to advocate respecting teachers and the education of the classics (the Four Books), adoring Confucius and Mencius as the authority, and all the intellectuals' work was confined to explain the Sage's words; doubting or disproving the Sage's claim was seen as committing high treason. On the other hand, due to the influence of the Soviet system, for a long time there was also the consensus of 'the leaders represent truth', the students were asked to 'do the job following orders' and 'be a never- rusting cog'. In this cultural and institutional context, young students' scientific critical spirit was depressed. Most people formed the habit of adoring the authority and blindly believe the books since they were kids.

3. 拓宽学生个性化成才通道, published on 2013-05-01

由于应试教育的长期影响，学生习惯于接受知识的灌输，相信书本、相信经验、相信标准答案，普遍缺乏深入探究和独立思考的能力。批判性思维训练的缺失已成为制约拔尖创新人才培养的"瓶颈"。

Translation: Due to the long influence of exam-oriented education, the students are used to be infused in learning knowledge. They trust books, experience and standard answers and generally lack the ability of exploring deeply and thinking independently. The lack of CT training has become the 'choke point' of developing innovative talents.

Besides these quotes, other quotes in appendix 1.26 also show that the MOE correctly diagnosed a prevailing problem with traditional teaching methods,namely that Chinese students are trained to passively accept knowledge and that the traditional Chinese education advocates learning by reciting. As a result, the students always listen to the teachers and remember the correct answers in order to pass the exams. The students hardly question the "correct answers" in the textbooks or what is told by the teachers because remembering those correct answers can help them

pass the exam and get the credits. Teachers are also used to focus on passing on existing principles and theories but pay little attention to leading students to think about the questions and problems. The MOE makes clear that there have not been enough educational activities inspiring students to rethink the knowledge they have learnt and become interested in researching and exploring things more deeply. CT is probably seen as a way to remedying this situation. But some teaching of CT contradicts the spirit of CT and still harks back to traditional teaching methods.

If students only remember what they are told by the textbooks or the teachers, the students are not developing their own understanding in learning. An important meaning of CT is to decide what to believe and daring to challenge what is told, including facts or theories told by the authority (Glaser, 1941). So simply accepting what is told by the textbooks or the teachers can be seen as a lack of CT and is the key problem of Chinese traditional education, according to the MOE, who tend to hold the opinion that solving the problem of lacking CT means solving the problem of learning by reciting. In other words, though these texts do not directly say why CT is important, eventually it is expected that through cultivating CT Chinese education can let students construct their own understanding in learning, i.e. engage in independent thinking. In this way, the first reason for which CT is valued is to let students stop only remembering the existing knowledge and start making their own understanding after having been introduced to some existing knowledge.

Interestingly, no MOE text appears to think critically about the belief that Chinese education is generally worse than Western education in cultivating CT, though Western educators have also been worried about failing to engage their students with CT (Allison, 2014; Brookfield, 2012). Perhaps this can be seen as lacking CT too. The idea of criticizing Chinese traditional teaching method has become a wide-spread opinion and no one challenges it. Nevertheless, it is a mainstream opinion of the MOE that CT is lacking among Chinese students and that the traditional Chinese

education method is responsible, though there are advantages of Chinese education envied by Westerners, such as maths education.

Cultivating innovative and creative thinking can be seen as the second reason for which CT has been valued by the MOE. Among the 76 texts there are 96 paragraphs mentioning CT, and among the 96 paragraphs, there are 46 paragraphs maintaining that developing innovative talents is the ideal of Chinese HE (see appendix 1.27). The theme of these paragraphs is that changes need to be done in the current HE system by developing or in order to develop innovative thinking and CT. Some of these paragraphs did not explain how CT and innovative or creative thinking are linked but simply equate these two types of thinking. There are also texts emphasising the importance of CT and being innovative together. To illustrate and translate some quotes of this kind:

1. "不适应"给教育改革添动力, published on 2013-04-10

当下的教育改革一再强调要加大创新教育、想象力发展、批判性思维

Translation: Current education reform repeatedly emphasises that innovative education, imagination development and CT should be strengthened.

2. "不适应"给教育改革添动力, published on 2013-04-10

批判性思维、自主性创新意识明显不足，视野狭窄，最终必然出现各种"不适应"。

Translation: CT and independent innovative tendency is obvious lacking; the narrow scope will definitely cause various kind of 'maladaptation' in the end.

3. 改革创新 培养卓越医生, published on 2014-03-13

以教师为中心的教学方法...但培养出来的学生, 总体而言，追随教材，追随现成知识和既有答案，习惯依从和遵循权威，发散性思维、批判性思维训练不足，创造性较差

Translation: The teacher-oriented teaching method...in total, produce graduates who follow textbooks and existing knowledge and answers, habitually comply with the authority, lack of training of divergent thinking and CT and are worse in creativity.

Some others explain the relationship between CT and innovative thinking by saying that in order to achieve the ideal of developing innovative talents, a series of changes, including strengthening CT, need to be made

in current HE system. These changes are focused on building a student oriented education system. It is expected that through these changes, Chinese university students will become more active in the learning process. The students will want to study and have their own plan. The students will not only learn because they need the credit and degree but because they want to explore the academic areas and find answers for the questions they are interested in. The students will have the motivation of asking questions while they are learning. When the students cannot find an answer from the existing knowledge, it is expected that the students will try to research on the unsolved problem and find an answer by themselves. Also, some existing knowledge can be wrong and it is expected that there will be outstanding young graduates who can figure out the mistake and propose new and original findings.

To illustrate and translate some quotes of this kind:

1. "不适应"给教育改革添动力, published on 2013-04-10

为了让孩子得到更为深入、深度的创造性发展，我们应该对学校教育、家庭教育乃至课堂模式、评级制度等，进行深入反思和纠正，少一些题海战术、圈养思维，多强化社会化发展思维、开拓性发展思维，以及独立性、批判性思维。

Translation: For letting kids have deeper creative development, we should think reflectively and correct school and family education as well as the form of classes and assessment. There should be less assignments but more social development thinking, pioneering development thinking and independent and critical thinking.

2. 高校自主选拔录取改革试点工作会议交流发言汇编, published on 2013-03-31

为使更多学科特长突出、具备创新潜质的优秀学生脱颖而出，我们在评价标准和考试形式上进行了较大的改革。...把考查重点转向对学生长远发展更为重要的潜能、兴趣、理想抱负、想象力、逻辑思考与批判性思维、领导力、社会责任感等要素上来，为各类具有不同特点和创新潜质的优秀人才脱颖而出创造条件，努力为北京大学建成世界上最好的本科教育奠定基础。

Translation: For letting more students who are outstanding in certain subjects and students with innovative potential to be noticed, we reform our assessment and evaluation method...our aims in assessment become students' potential, interests, ambition, logic and CT, leadership, social responsibility, etc., which are more important for students' development, in order to provide opportunity for talents with

innovative potential and different specialties, and therefore endeavor to build the base for Peking University to become the world-class undergraduate education.

3. 华东师范大学实施研究生创新能力提升计划有效推进研究生教育创新发展, published on 2009-07-03

全面提升学校研究生科研创新能力, 在授课方式上，积极推进教学改革，提倡讨论式、互动式、案例式教学，注重训练并培养研究生自主获取知识、发现问题、形成批判性思维进而发展知识的能力。

Translation: To improve postgraduates' researching innovative ability fully, when design teaching method, we should actively promote education reform, advocate discussion, interaction and case studies, and emphasise training the postgraduates' ability of acquiring knowledge, discovering problem and forming CT to develop knowledge.

More quotes showing that CT is valued in relative to innovative thinking can be found in appendix 1.27.

If the students can identify unsolved problems and propose smart and new answers, they are actually innovating and creating new knowledge. As CT is mentioned as a part of these changes of student oriented education, it can be said that CT is valued for cultivating innovative and creative talents.

The third reason for which CT has been emphasised is related to the theme of international achievement of Chinese HE. There are 14 paragraphs (see appendix 1.28) stating that the MOE introduces CT for building world-class universities and cultivating talented students who will be recognized according to international standards. It is stated that CT must be added in science classes of Chinese universities so there will be world-class Chinese scientists; a lack of CT can result in students' failure in international competition; Chinese students who were evaluated as excellent in Chinese education system had been eliminated in international competition. In sum, being competitive in international education is a drive for emphasising CT. There are a few texts reporting the achievements after CT was emphasised in some universities. It was reported by Nanjing University that their undergraduate students had performed equally well in CT tests compared to undergraduates from the University of California, Berkeley in the US.

Tsinghua University reported that they had added CT in their physics classes for developing future world-class scientists and that some of their outstanding students had published articles in world-class journals. Peking University reported that they had been exploring the way of becoming a world-class university (世界一流) through developing students' potential, creativity, logical thinking and CT. All these themes indicate the aim of building world-class education.

To illustrate and translate some quotes of this kind:

1. 对培养一流拔尖创新人才的思考, published on 2012-10-10

清华大学的"清华学堂物理班"给了我们前所未有的机遇去面临挑战。总之，出世界一流物理学家应该是中国一流大学物理系的历史使命。我们工作的关键是要创造一个好的环境以利他们将来成才。对于杰出人才的培养，我们特别要重视对学生的批判性思维、想象力和好奇心的培养。

Translation: Tsinghua University's 'Tsinghua Physics Class' gives us an unprecedented opportunity to face the challenge. All in all, developing world-class physicists is the historical mission of the physics departments of Chinese top universities. The key of our work is to create a good environment for students to become talents. For developing top talents, we need to particularly emphasise the cultivation of CT, imagination and curiosity.

2. 杜玉波同志在创新高校人才培养座谈会上的讲话, published on 2014-04-04

拔尖学生普遍展现出既有远大理想又脚踏实地的精神风貌，在批判性思维能力、知识整合能力、相互协作能力等方面表现突出，部分学生已在学术领域崭露头角，在世界顶尖学术期刊上发表论文，在国际大赛上表现优异。

Translation: Top students generally appear to have both great ambition and down-to-earth practice. They have outstanding abilities in CT, knowledge integrating, coorporation, etc. Some students have already performed well in academics. They have published articles in world-class journals and perform well in international competitions.

3. 构筑大类培养和自由转专业的成才通道, published on 2015-02-16

据加州大学伯克利分校"全球研究型大学本科生学习经历调查"显示，南大学生"学术思维和表达能力"进步程度，经历"三三制"者显著优于未经历者；学生批判性思维能力等进步程度与伯克利无显著差异。

Translation: According to the 'Research of undergraduates' experience in global researching universities' by the University of California, Berkeley, Nanjing University's students who had the 'three level curriculum' improve better in 'academic thinking and expressing ability' than students who had not studied in this curriculum; Nanjing University's students' improvement in CT is equal to students of Berkeley.

In sum, there are three frequently mentioned reasons for which CT has been valued: motivating students to engage in independent learning; cultivating innovative and creative talents; building world-class HE in China. These three reasons are gathered based on analysing the MOE texts. In those texts, the phrases 'stop learning by reciting', 'innovation and creation' and 'world-class education' are used frequently as the education ideal in the same paragraph with CT. Also, CT and innovative/creative thinking are frequently mentioned together, though sometimes the relationship between CT and these terms has not been explicitly stated.

These three reasons are interrelated since it is hoped that innovation in teaching method will lead to students becoming innovative thinkers, and CT is seen as a necessary base for achieving these educational innovation. By thinking critically about the existing knowledge, the students can decide what to believe and make their individual understanding. By doing so, the students are more likely to discover the unanswered questions or unsolved problems, comparing to the times when the students were only remembering the existing knowledge. By researching unsolved problems, the students are more likely to propose original findings and create new knowledge. By having a generation of young graduates who can actively create new knowledge, Chinese higher education can keep on updating its achievement and compete confidently for being the world-class education. Therefore, cultivating CT can be seen as a necessary start for achieving this ideal picture of Chinese HE.

5.5 The process of adopting critical thinking by Chinese higher education

The sections above show that CT modules and curricula have been opened in many Chinese key universities and CT has been valued as being conducive for achieving the ideal of Chinese HE. This section will provide a more historical overview of how CT has been adopted into Chinese HE. Five of the 76 MOE texts are policy documents. These policy documents are different from other documents because they are composed by the government while the other documents are written by educators or journalists and published by the MOE. Therefore, the policy documents are more likely to be taken as directions or orders by Chinese universities while the other documents may be only taken as opinions or comments. Learning from Western education systems and critiquing the old Chinese education system can be seen in the process of adopting CT.

In the sections above, the educational changes emphasising CT have been discussed. The official policy document announcing these changes is the Outline of National Plan for Medium and Long-term Education Reform and Development (国家中长期教育改革和发展规划纲要) (2010-2020). This outline is a programmatic document issued by the CPC Central Committee and the State Council for development and reform of Chinese education in the 10 years between 2010 to 2020, and is said to be the principal guideline for Chinese education until 2020 by the central government (Xinhuanet, 2010).

This policy document was published on 29th July 2010, but many of the CT modules had been opened in Chinese universities since 2003. That is to say, those CT modules were not opened because of this policy document, though the releasing of this document means CT will continuously be emphasised in the universities. Some Chinese educators must have started to emphasise CT before the release of this policy document as many modules had been opened before 2010. The earliest MOE texts mentioning CT was published in 2002, one year before the earliest CT module. In this text a deputy to the people's congress, Pan Yunpeng, said that the development of internet and multimedia technologies is useful for cultivating students' CT because these technologies can provide richer information to the students. This text only

mentions CT in passing but shows that CT had attracted the attention of this policy maker. The earliest CT module was opened in 2003 and the earliest MOE text mentioning CT was published in 2002. These times indicate that CT may be started to be emphasised in those years.

In 2004, an official policy document mentioning the term CT was issued. This is also the first policy document mentioning CT. Surprisingly, this document is a notification guiding Physical Education (PE). The title of the text can be translated as "Notification of the Issuing Physical Education Undergraduate Education Main modules Teaching Guidelines for Universities by General Office of the Ministry of Education" (教育部办公厅关于印发《普通高等学校体育教育本科专业各类主干课程教学指导纲要》的通知). The document states that universities should fully consider theories and knowledge in relevant areas, emphasise cultivating and improving students' ability of cognition and understanding, correctly understand and grasp different thoughts and academic opinions, combine theory and experience of foreign countries with conditions of China, in order to make students primarily form critical, open and compatible thinking methods.

It is not clear why CT was firstly mentioned in a policy document regarding PE, but it is clear that in this document CT was mentioned only once together with learning from foreign countries, so again CT is linked with learning from foreign education. Considering the fact that there is a stronger trend for Chinese athletes to join global activities in the 21st century than before (Hong-yun, 2004), it is possible that CT is emphasised in this policy document because in global activities Chinese P.E. educators got an impression that CT is an advantage of Western education.

Between 2004 to 2007, beside a translated document of 21st century skills released by the United Nations Educational, Scientific and Cultural Organisation (UNESCO), the documents published by the MOE are all reports on the facts that Chinese universities' leaders had visited Western universities to learn about how to cultivate students' CT, and articles investigating education systems in the West (see appendix 1.29). In these

MOE texts, CT is mentioned as strength of education systems in these countries. These texts also show that Chinese educators and university leaders had learnt from Western education systems.

Since 2007, the MOE has published various reports in which CT was mentioned. Between 2007 and 2010, some MOE texts mention CT as part of the pilot of the reform carried out at some universities (改革试点). After the release of the Outline of National Plan for Medium and Long-term Education Reform and Development in 2010, CT was frequently emphasised as part of this national education reform, as one of the changes needed to be done in this reform.

In 2009, one year before the release of the Outline of National Plan for Medium and Long-term Education Reform and Development, three scholars who had been writing this policy document were interviewed by Xinhua News Agency for introducing this national education plan to the public. In this interview, CT and learning from other countries were linked again. According to the interview transcript, CT was mentioned when the interviewer asked what the features of education reforms in other countries are that can be seen as advanced in education. Zhou Mansheng, who was the Deputy Director of this center said that "What comes first is CT. Facing a question, the students should not passively accept knowledge but think critically; the second is the innovative ability, the independent judging and thinking instead of simply repeating the knowledge; the third is the analysing and problem-solving ability; the fourth is the life-long learning ability; the fifth is the teamwork ability; the sixth is the self-management and self-learning ability".

This interview again shows that CT is valued by this officer who had been writing this policy document. Also, CT was said as a feature of those countries whose education systems are advanced. The National Center for Educational Development is a center belongs to the MOE and focuses on providing educational strategies and consultation, so this officers' answer can represent the MOE's opinion. As CT is seen as an advantage of the advanced education systems, it is reasonable to consider that CT is valued

by the MOE because this advantage is wanted by the MOE. This is again an example of the KT process in which the decision makers see the competitive advantage of another organisation and therefore want to import the knowledge which causes this competitive advantage.

The Outline of the National Plan for Medium and Long-term Education Reform and Development (国家中长期教育改革和发展规划纲要) (2010-2020) released in 2010 is perhaps the most important policy document mentioning CT until now. This outline is said to be the first and principle guideline for Chinese education until 2020 by the central government (Xinhuanet, 2010). In chapter 11 of this document (whose title is 'Reform of Cultivation System for Talents or Professionals' (人才培养体制改革), it is stated that the quality of education has been improved, but still the teaching content is complex, difficult, uncommon (which means knowledge that is not daily and frequently useful) and old; the teaching method relies too much on the textbooks and lectures; there has not been enough teaching content reflecting the need of this era; there has not been enough cultivation for critical and creative thinking.

This document explicitly states that there is not enough CT education , and mentions the perceived lack of CT in Chinese students, as well as the critique of the old education system. Apparently, this policy document shows that emphasising CT is part of the education reform which intends to improve certain shortcomings of the old education system.

In the years after 2010, articles and news reporting on changes and reforms made in various universities according to the national plan have been published by the MOE. The number of documents mentioning CT is higher after 2010 than before 2010, which indicates that after the release of this national plan, CT has become more important in Chinese universities. The table below lists the number of MOE documents mentioning CT in each year:

Year	2002	2003	2004	2005	2006	2007	2008	2009	before 2010

Number	1	0	2	0	4	3	5	8	23

Year	2010	2011	2012	2013	2014	2015	after 2010
Number	7	5	18	9	12	1	50

In December 2014, the MOE issued another policy document mentioning CT. The title can be translated as “Suggestion of the MOE on Strengthening and Improving Construction of Postgraduate curricula” (教育部关于改进和加强研究生课程建设的意见).This document states that one of the requirements for constructing postgraduate curricula is respecting and inspiring postgraduates’ research interest, and emphasising cultivating their independent thinking and CT, and comprehensively improving the creative ability and developing ability.

This document shows that cultivating CT in both undergraduate and postgraduate courses is seen as important by the MOE. It is worth noting that this document for postgraduates was issued four years after the release of the Outline of National Plan for Medium and Long-term Education Reform and Development in 2010. Chinese undergraduate education normally lasts four years. According to this timeline, the undergraduates enrolled in 2010 have started their postgraduate study in 2014. This can be seen as a continuous emphasis on CT in both undergraduate and postgraduate education.

In sum, CT has received attention from policy makers and educators since around 2000. This may be a reflection of valuing Western educational ideals and the internationalization of Chinese education since the beginning of the 21st century (Fanos and Cataldi, 2013). Afterwards, Chinese university leaders tried to take on board lessons from Western HE systems and ran pilot reforms in a few universities, even before CT was mentioned in the national educational plan in 2010. The policy document announcing this national plan critiques some aspects of the old education

system in China and emphasises CT at the same time. In this way, CT is regarded as as a useful tool to overcome some of the shortcomings of Chinese education. What's more, postgraduates' CT had been mentioned in a policy document, which implies that relevant teaching activities, such as modules and curricula, for postgraduates will be carried on. This does not imply however that CT teaching will necessarily be innovative both in undergraduate and postgraduate teaching. There are still many hurdles to overcome in this respect, from inertia in teaching to allocation of funding to universities for such activities.

5.6 Conclusions

This chapter has three main findings. Firstly, existing modules of CT and its institutional context are gathered and presented. This finding shows an overview of the efforts to build a competitive student base through the introduction of a series of CT modules and curricula opened at Chinese universities. Secondly, based on reviewing themes and frequencies in the MOE documents, it is found that there are three reasons for which CT is valued, including developing independent thinking, innovative thinking and world-class HE in China. Thirdly, this chapter makes inference about the process through which CT has been adopted into Chinese HE. The time can be traced back to the first couple of years of the 21 century since when the internationalization is an obvious feature of Chinese education. Learning from the Western HE systems and critiquing some aspects of the old education system of China have been explicitly stated by the Chinese principle educational policy document. This concern of CT has been continuous and extended to postgraduate education.

Government efforts to build a competitive student base are focused on developing innovative talents. This educational ideal is mostly associated with CT and is a part of the government's national education plan released in 2010. Therefore, the teaching activities of CT in universities aim to realise this ideal, considering the fact that the government's plan directs the overall expectation of Chinese HE. So developing innovative talents can be seen as the reason for transferring CT from Western education systems.

In next chapter, I will present how CT is taught in one university, based on which in chapter eight I will discuss what improvement may be needed to better cultivate innovative thinking alongside innovations in teaching methods.

Chapter 6 Research Findings of the Case Study at Peking University

6.1 Introduction

This chapter presents the findings based on observing the CT module offered by Peking University which I conducted during the spring semester 2014. As I have shown in chapter five, a few Chinese universities have started offering modules that teach CT. Typically, these CT modules are taught in philosophy schools, run by lecturers whose areas are in logic and philosophy and are offered as elective modules to all students of those universities. The CT module offered by Peking University can be seen as a typical module because it has these conditions. By researching what knowledge was taught in this CT module and the ways CT ideas and topics were taught to the students, this chapter intends to study how Chinese university students get access to CT, and what material was covered in the module. This chapter will therefore shed light on the practice of classroom teaching of CT at this Chinese university. Unsurprisingly, it was found that the practice was mainly lecture-based which corresponds with findings about the Chinese traditional teaching style reviewed in chapter three. Since the finding regarding teaching style is not a surprising one, this chapter will discuss it briefly and then focus on the knowledge of CT imparted to the student in each class.

The literature review of KT in chapter two shows that when learning in a different context, there are four factors being influential: 1. how the decision makers value the knowledge and for what reasons they value the knowledge (the knowledge is, in this case, CT); 2. the access to this body of knowledge; 3. the culture and 4. the knowledge background of the recipient unit. This CT module of Peking University is one way through which the students in this university can get access to knowledge of CT. Therefore, this CT module has influence on some Chinese university students' understanding of CT and constructs CT in Chinese HE. Also, as stated in chapter five, this CT module is a typical one among the CT modules in various universities, so there may be some modules in other universities which give access to CT knowledge in similar way and impress their students with understanding of CT similar to this CT module.

As will be presented in the following sections, how this CT module gives access to the students may impress the students with an understanding that is different from the Western CT in two aspects. Although everyone may have a different understanding of CT and each teacher may impart CT in their own way, there are two aspects (the aspects of uncertain conclusions and disposition) that are rather important in Western conceptualisations of CT. Also, as I will discuss in chapter eight, these two aspects contain important guidance for deciding what to believe and do, which is the focus of CT according to Ennis (1962), and are meaningful for deciding how to create based on existing materials, which is linked to the educational ideal of innovative talents development of the MOE, as found in chapter five. As a result, these two aspects (uncertain conclusion and disposition) should not be excluded from CT teaching. What is more, adding these two aspects in lecturers is compatible to the Chinese indigenous education system, so in this way improvement in CT teaching can be realized without big changes or much investment.

The following sections will firstly present what was taught in this CT module and then present these two findings, i.e. the two missing aspects, respectively.

6.2 Teaching content of the critical thinking module at Peking University

6.2.1 The outline and general conditions of the module

This CT module in spring 2014 took about 3 hours per week (there was a 2 hours lecture on each Thursday, and a 2 hours lecture on Tuesday every other week, so on average the lecture is 3 hours per week). I got access to this module by contacting the module lecturer Professor Liu Zhuanghu. After having stated my research purpose, I received his and the school's approval to engage in participant observation. The approval letter can be found in appendix 3.1 in the end of this thesis.

The classes of this module took place in a lecture theatre. The lecturers' platform was in the front and equipped with a computer and a screen to play power point slides, which were used in each class. The lecturer did almost all the talking through the lecture, during all lectures in the semester. Few students asked questions during the lectures. Professor Liu did try to encourage the students to get interactive by asking them questions and asking if they have questions, but students rarely responded voluntarily. These observations support the previous literature claiming that Chinese students are used to lecture-based teaching instead of discussion and are not used to asking questions in classes (Atkinson, 1997; Liang and Yuan, 2008; Wangensteen, Johansson, Bjorkstrom and Nordstrom, 2010).

In an informal chat with Professor Liu, he said that it would be better to teach this module in small classes in which more interaction between the teacher and students can be done. However, he also said there were not have teachers and resources to break the large class into smaller ones. He agrees that CT should be cultivated through more discussions and interaction, but these can hardly be done in a class enrolling 200 students and only one lecturer. In fact, with lots of literature critiquing the lecture-based teaching style and lacking of interaction, most Chinese CT educators must have realized this problem. As stated in chapter five, there have been some small classes opened for the elite students (in elite universities). But for the mass students (in top universities too), lecture-based teaching may be the only teaching method they can afford. After all, re-structuring a large class into several smaller ones is a big change. On account of this situation, how to teach a large size lecture-based CT module is also important.

The teaching content is crucial for a lecture-based module. According to the syllabus, the module content consists of seven parts. The table below lists the topics of these seven parts and the dates when these parts were taught respectively:

1. Part One: What is critical thinking	Week 1-2, Feb.20-27

2. Part Two: Claim and Assertion	Week 3-5, March 620
3. Part Three: Question and Claims	Week 5-8, March 20-Apr.10
4. Part Four: Reasons and Good Reasons	Week 8-10, Apr.10-22
5. Part Five: Clarify the Meaning	Week 11-12, Apr. 24-May8
6. Part Six: Evaluate Deductive Arguments	Week 13-14, May.15-22
7. Part Seven: Evaluate Inductive Arguments	Week 15-16, May 29-June 5

During the lectures, I listened and wrote down what was taught in the classes, and how these topics were explained. After listening to each lecture, I tidied my record and wrote up my field-note within 24 hours. The records I made during the lectures are in Chinese as the lectures were taught in Chinese language. The field-notes I wrote up after listening to each lecture was in English for making it easier to be imported into my thesis. The next section will present what and how those seven parts taught in this CT module.

6.2.2 The teaching content of the module

6.2.2.1 Part 1: What is CT?

CT was regarded as a very rich concept according to the lectures' presentation. At the beginning of this module, the lecturer said that he would make a modest contribution through this module and that this module will only teach about the knowledge (知识) of CT instead of the abstract philosophy of CT. It was not further explained what the knowledge of CT was, what the abstract philosophy of CT was and what the difference between them is. It was then quickly presented that CT had the historical problem of translation and that CT was not negative but neutral; CT is not a type of thinking but a feature of thinking; CT can be seen as scientific thinking or method; CT was a worldview and a kind of

belief involving using what is known to make judgment; and CT involves not being influenced by the traditional Chinese culture telling people to accept what is told without doubting.

Below are some quotes from the lecture I tape-recorded (quoted with permission):

我们这个课呢，从课程目的上说，是传授知识，在传授知识的过程当中培养批判性思维。这个课呢叫批判性思维，但是批判性思维是一个历史翻译的问题，这是个误解。批判这个词没有任何意义，好像一说批判就觉得，啊。。。批判在这里是一个中性的词。批判性思维不是一种思维的类型，它是一种好的思维，就是我们应该如何思维。其实这个'批'，。。。应该叫它判定性思维、评定性思维。它是一个看问题时我们的世界观，世界观呢是哲学上一个抽象的世界观，但是我们这里讲的呢是知识体系，关于世界关于社会的知识体系。现在有很多信息源，包括网络啊等等的。怎么样通过这些别人说的形成我们自己的知识。我们呢主要是从知识的角度出发，去看看怎么判断别人说的，去看看怎么检验信息的来源。

Translation: this course, the purpose of this course, is to deliver knowledge, to cultivate CT in the process of delivering knowledge. This course is called CT, but CT has a problem of translation in history. This is a misunderstanding. The word 'critical' does not have any meaning. It is like once 'critical' is talked about, it is ... 'critical' is a neutral word here. CT is not a type of thinking. It is a good way of thinking. The kind of thinking we should adopt. The word 'critical', it should actually be called thinking for making judgment or evaluation. It is our worldview when we are looking at questions. Worldview is a philosophical abstract concept. But here we are talking about a knowledge system, a knowledge system of the world and society. There are many sources of information nowadays, including the internet, etc. How to form our own knowledge based on what others said. In this course we learn how to judge others' saying and checking the sources of information based on a perspective of knowledge.

Afterwards, it was taught that CT involves not being influenced by the traditional Chinese culture telling people to accept what is told without doubting (quotes):

其实批判性思维在中国更重要一点，这就是因为中国长期的文化习惯，使得中国人相对于西方人缺少批判性思维。我们比较容易直接接受别人的观点。我们

的灌输式的教育方式，让我们从小养成了这种习惯。当然如果我们是小学生我们当然就是听老师的，但是我们现在大了。就比如我现在在这里讲的，大家就要想一下有没有道理。

Translation: In fact CT is even more important in China. This is because the cultural habit that has long been kept, means that Chinese people lack CT skills seen in Western people. We are more likely to accept others' opinions. Our indoctrination education means we lack such a habit. Of course, if we are primary school students we should just listen to our teachers, but we are adults now. For example, what I am talking about here, should make you think if it is reasonable.

Here it can be seen that the lecturer tried to tell the students that CT is a Western concept and showed the potential difficulties of learning and practicing CT within a Chinese cultural context. Afterwards, it was explicitly said that this module would mainly teach five properties of CT. It was admitted again that these five properties may not completely cover all the content of CT but mainly concern the aspect of logic. The first property of CT was said to be clarity. This was explained as being able to organise an argument and use accurate words. The second was relevance. This means being able to know what can and cannot be used as the evidence, the latter including appeals to authority and emotion. The third was consistency, which means avoiding contradiction in an argument. The fourth was legitimacy, which means avoiding taking beliefs as reasons. The fifth was predictability. This was explained as being able to foresee some effects based on some causes. Since the lecturer said that this CT module would impart the knowledge of CT and these five properties were what would be taught in this module, it can be understood that these five properties were regarded as the core aspects of CT in this module.

Below are some quotes from this lectures:

批判性思维是一种好的思维方式，一种好的做法。要说批判性思维就是理性思维也没错。批判性思维是理性思维的具体表现。我这里分了五个方面，这不一定很全面。还可以从不同角度来分的。而且我们这个课叫逻辑与批判性思维，我也是研究逻辑的，所以我的这个分类呢也主要是从逻辑的角度。

Translation: CT is a kind of good thinking method. It is a good way to do. It can be said that CT is rational thinking. CT is a particular way of performing rational

thinking. Here I divide CT into five aspects. This may be not complete. It can be classified into different aspects. And this course is called logic and CT. I study logic. So this way of classifying aspects of CT is based on a perspective of logic.

As for the abstract philosophy of CT, he did not explicitly explain what it meant. The teacher did not refer to any particular philosophy related to CT, such as Kant, the Enlightenment or the Frankfurt School. However, the teacher must have referred to something apart from the five properties above, because these five were the focus of this module while the abstract philosophy was not. The ideas involving features of thinking, worldviews, beliefs and culture may be taken as part of the abstract philosophy by the teacher, since these ideas are different to the five and were not talked about much. These ideas were presented by one or two sentences, but no examples were given to illustrate what these ideas were. This was a sign showing that these ideas were not the focus of this module. Also, these ideas can generally be understood as being more abstract than the five properties. The five properties concern evidence and arguments. Logic and reasoning can be seen as what link evidence and arguments.

Therefore, the five properties can be summarized as being able to use evidence to make an argument. The parts where he mentioned the feature of thinking, worldviews, beliefs and culture can be seen as more abstract because it is harder to find a specific example or event illustrating these ideas than an argument. The teacher mentioned that CT could be seen as a type of scientific thinking and scientific method, but again only slightly and did not speak more about how CT and scientific method were linked. Perhaps in this module thinking scientifically was regarded as an abstract philosophy as well, at least the part of scientific thinking beside logical thinking.

The textbook of this module does not present what the abstract philosophy of CT is but there are two sections that talk about the correct attitude of CT (正确的态度) and the principle knowledge of CT (原则 性知 识) respectively. The principle knowledge of CT are logical rules and reasoning methods, which is, according to this textbook, commonly agreed

between CT experts (the original Chinese text in this textbook is: 尽管在如何培养批判性思维方面存在不同的意见,在掌握逻辑探究的原则何推理方法的知识方面,却是大多数专家所认同的, p. 14). Since the textbook distinguishes the attitude and knowledge of CT, and the lecturer said this module will focus on knowledge of CT, it can be understood that the attitude of CT is excluded from this module.

On one hand, since those ideas regarding worldview and attitudes were mentioned slightly, they must be taken as a part of the CT content. On the other hand, however, this module would not focus on them. According to what the lecturer said this module would focus on the knowledge of CT and not focus on the abstract philosophy of CT, and generally these ideas can be seen as being abstract, it can be understood that these ideas involving features of thinking, worldview, beliefs and culture were taken as the abstract philosophy of CT, which were not focused on in this module.

CT is both a kind of value and skill. It should be noticed that the five properties being the main topics of this module are identical to the definitions that posit CT as a kind of skill by Western critical thinkers, such as Ennis (1987), McPeck's (1981), Glaser (1941) and many others. These Western critical thinkers' definitions all include the content regarding evidence, inference and arguments. However, these Western scholars also define CT as a kind of value which involves disposition, attitudes and spirit (ibid). What was mentioned in passing but said as not the focus of this module (the worldview, belief and culture), however, is related to the Western aspect of disposition and attitudes. Although it cannot be said that the CT content related to disposition aspect was absolutely excluded, rather it was understated to a large degree compared to the CT content related to logic and reason. This finding corresponds to a finding in chapter five---- documents published by the MOE tend to emphasise that CT is a type of ability, instead of a type of value, too.

As mentioned above it was said by the lecturer that CT is neutral (the original Chinese word in this module was ' 中 立 的 '). This idea was

mentioned for a few times and in an emphasising tone. However, it was not explained further what being neutral means. It was just said that CT is neutral and then the lecturer started to talk about something else regarding logic and reasoning. It may also be hard for the students to know if the lecturer encouraged the students to believe there is right or wrong. On one hand, it was presented that the mission of this module was to teach students how to identify a wrong point of view and not to be misled by other people's arguments. On the other hand, it was said that sometimes there was no right and wrong and that what was believed to be true could turn out to be false later.

The problem is that the lecturer's presentation regarding these ideas ended there. It felt that these ideas relating to CT was not hidden from the students but was not explained in depth either. These ideas were put aside right after they were mentioned. Many questions regarding being neutral in deciding whether there is true or false, truth or falsity, remained unclear. If there is no truth and falsity, as said by the lecturer, why should we learn how to detect a false argument? If there is true or false, as said by the lecturer too, how was the true proved to be false later and how can being neutral assist in this situation? It seems a neutral position is taken by the lecturer here again. This is actually a very interesting question and is related to the theory of uncertainty but the explanation was too short here. This can be seen as a problem of how CT is taught in this module. Perhaps this is also taken as part of the abstract philosophy which was not this module's focus. The quotes below are some of the lecturer's speaking of this class. These quotes indicate that there are some questions the lecturer was unclear about or decided not to talk about in this course:

到底什么叫正当和合理，这个说不清楚的。但是即使说不清楚的时候也要尽量去保持这个概念，要有这个愿望和目标，就是去说是否合理。我们期待有这样一个概念就是有正当和不正当、合理和不合理这回事。

Translation: What exactly is being proper and being reasonable is hard to be defined clearly. But even though people should try to keep this concept. We should have the hope and goal to achieve being reasonable. People should expect that there are such thing as being proper (or not) and reasonable (or not).

第二步就是你要去应用，要去说出来或者写出来，那就是更现实的，更实际的。第二步跟行为有关系，第一步跟观点有关系。检查观点就是看理由和观点之间的联系合不合理。行为就是要怎么做，怎么计划怎么选择怎么制定方案。支持谁不支持谁。这就比观点判断的情况更复杂一点。但是对于学生来说观点判断和大家关系更大一些，所以这也是我们这个课的，就是说，先围绕着这一点来讲。

Translation: This is the first step. The second step is to apply, to speak it out or write it up. That is more practical. The second is about actions. The first is about opinions, i.e. is the link between reasons and opinions reasonable? Actions are about what to do, how to make plans and choice, who to support. This is more complicated than forming opinions. But for students forming opinions are more relevant, so this is why our course will focus on this point.

Perhaps it was because that these ideas were not the focus of this module, these relating questions remained unanswered. Even though, these questions can make the students feel confused because the lecturer had both mentioned there was true and false and there was not true and false but not discuss the issue of absolute true and false in detail. At least on surface, these ideas contradict each other, so explanation was needed.

Adding some explanation regarding what is being neutral and when the judgment is not either-or can be helpful for solving this confusion. As will be presented in chapter seven, some students have written about this confusion on Renren posts as well, which means there were students having such confusion.

In sum, what can be learnt in this part is that CT is about how to make an argument properly (or checking an argument made by someone else) and something that is very big and hard to define. Only the former part was said to be the focus of this module. It can be understood that by saying this module would teach the knowledge of CT the lecturer meant teaching the logical rules and reasoning process. Although making arguments based on evidence took up the main content of this module, it was admitted and reminded by the lecturer that these do not exhaust CT, as they omit worldviews, beliefs and culture.

6.2.2.2 Part 2: Claim and assertion

Knowledge regarding how to make or evaluate an argument was taught in this part of the module. It was taught that not all sentences were assertions (the original Chinese works used in this module is ‘ 断 言 ’ whose literal translation is assertion). Some exercises were given asking the students to answer which sentences were assertions and which were not. Through these exercises, it was taught that assertions were those sentences claiming that something was either true or false. Some other sentences simply explained a personal opinion or a fact happening before. These sentences were not said to be assertions. The lecturer reminded the students that an assertion must not be made without evidence. If someone claimed something to be true or false but did not provide the evidence, the students should regard that he or she was expressing an opinion. The students could also typically debate by pointing out that this is an opinion but not an assertion. If someone claimed something to be true or false based on a hypothesis, the students could regard this claim as an inference (推 理) instead of an assertion. It was taught that the students can reject this claim by saying that ‘this is just an inference’. So saying so is taught as a normative way to disagree with someone, implying that the premise is not accepted.

As assertion can only be either true or false, depending on the evidence and inference, while an opinion did not have to be true or false. It seems this part of teaching content answered some of the confusion I wrote in the last part. In last part, the lecturer mentioned checking out the false points and later on he said there was no true and false answer. Not much explanation was given regarding when there is true and false and when there is not. In this part the lecturer presented that there was true and false for assertions but no true and false for opinions. This distinction between assertions and opinions may be analogous to the difference between the situations when there is true and false and when there is not true and false. Perhaps the lecturer meant that the students should be neutral for people’s opinion but insist judging the truth of their assertion. This idea seems reasonable so distinguishing assertion and opinion can be seen as one way

to understand what being neutral means. However, the lecturer did not link being neutral with the distinction between assertions and opinions. And this distinction cannot explain how what people once believed as true become false later. So it cannot solve all the confusion I wrote in the last section.

It was also emphasised by the lecturer that an assertion sentence and an non-assertion sentence could be confused easily. He exemplified this confusion: it was an explanation of an existing fact to say that it was raining and the floor was wet; it was an assertion to say that it had been raining so the floor was wet. The later sentence was claiming the causal relationship between the two facts so it was regarded as an assertion. In many cases in daily life, as reminded by the lecturer, two statements could be mentioned together but the relationship between them was not clarified. For example, those statements regarding raining and floor could be written as “It was raining. The floor was wet”. These statements did not indicate if the speaker saw the raining and the wet floor, or if the speaker only saw the raining and used it as the reason to expect that the floor must be wet, or if the speaker assumed that raining is the cause of the wet floor.

However, saying things without clarifying the relationship between sentences was said as a habit of Chinese language, and this habit may cause the listeners to have an unwarranted understanding of the meaning of a statement because the links between the sentences are suppressed. Due to this fact, it was suggested that the students should beware of this habit and not understanding the sentences by assuming the meanings, or the students would receive wrong information. The lecturer reminded that in daily life people could frequently encounter this kind of confusion so it was important to be able to recognize if people were claiming something. It was reminded at the same time that asking people if they have evidence proving something can be understood as being not polite.

What can be learnt from this teaching content is the importance of identifying assertions. This can be seen as the first step to think critically since one must realize that others are asking him or her to accept a claim

before he or she can judge if it is true or false. It can also be learnt that an assertion is concluded based on evidence and inference. Statements that do not include the evidence and reasoning process should not be regarded as assertions and therefore should not be accepted as being true.

Ways for checking the truth of a conclusion were also taught in this part. Firstly, students were reminded that a conclusion may involve more than one assertion and the students should not accept all the assertions because one of the assertions was well established. This mistake could be made if the students accept the conclusion too casually. Secondly, they were reminded that in many cases the quantifier word would not be explicitly stated, especially in Chinese language. For example, in English saying swans are white means all swans are white. Chinese words do not have the plural form. As a result, all swans are white, some swans are white and one swan is white could all be expressed in the same way: 天鹅是白的.

Here are some quotes of the lecturer's teaching:

分清复合陈述和简单陈述只是一种一般的规定。特别中国语言从古文转过来的时候，会把复合句变成一个单句。这就是中国语言比外文复杂的地方，英文里单句还是复句写得很清楚，但是汉语当中都没有。汉语当中经常有省略成分的做法。比如乌鸦是黑的，不说所有乌鸦是黑的，天鹅是白的，就不说所有天鹅是白的。所有这个词会被省略。

Translation: Distinguishing simple statements and compound statements is only a general rule. Especially since Chinese modern language was transformed from the ancient language, which often takes compound sentences as simple sentences. This is how the Chinese language is more complicated than foreign languages. In English, the simple sentences and compound sentences are clearly distinguished. But in Chinese language things are different. Chinese language often omits elements. For example, in Chinese language we will not say 'all crows are black'；or 'all swans are white'. The 'all' and plural expression are omitted.

Therefore, it was recommended that the students could refute a conclusion if the quantifier word were not clarified. Here an usual omission in the habit of using Chinese language was discussed, which can be seen as thinking critically of Chinese tradition. Thirdly, a conclusion must not contain assertions contradict with each other as many conclusions

involved not only one assertion. The knowledge of truth table was taught here: the truth of two propositions entails the truth of the conjunction of them (the truth of p and q entails the truth of ‘p and q’) and the truth of one of the propositions entails the disjunction of them (the truth of p and not q entails the truth of ‘p or q’).

In sum, this part of the module covered how to recognize an assertion and opinions and how to check the truth of assertions.

6.2.2.3 Part 3: Question and claims

It was presented in this part of the module that the purpose of an argument can always be understood as to answer a question. The claim can be understood as this answer. It was said that if in some cases it was hard to see which sentence is the claim, the student could recognize the claim of an argument by thinking about what question has been answered by this argument. Sometimes, more than one question can be answered so the students need to justify the truthfulness of the answers one by one. However, casually accepting all the answers because one of the answers has been solidly proved was said to be a typical mistake of argument. Sometimes, the question discussed in an argument can be secretly replaced by another question because of replacing some concepts involved in the argument. Therefore, it was reminded that when making an argument the students should pay attention to checking if the question discussed had been replaced or modified. As a result, a debate could end up with two people talking about different questions.

It was taught that some bad answers had been frequently made and accepted. Therefore, students were reminded that some arguments may mislead them. Some may mislead by taking advantage of their emotion. A few general methods of this kind of misleading arguments were introduced. Firstly, it was introduced that many had appealed to beliefs of a group of people as a strategy to persuade this group of people and receive the people’s support. It was not said that there are many people tending to believe what they want to believe, but the ideas are similar.

Secondly, conformist mentality (从众心理) was said to be another kind of misleading argument taking advantage of people's emotion. A claim accepted by many people does not mean that is true. On the other hand, it was reminded at the same time that the students should not reject a claim just because many people had accepted it either. Thirdly, some questions were said to mislead people by implicitly asking people to choose answers from two or more options. For example, the question asking "do you want happiness or success" implies that one cannot have both. This question can be corrected by asking "Do you think happiness or success is more important".

If there was a sole correct answer was discussed in this context, too. It was said that truth preserving and chasing the correct answer were encouraged, but the students should also be modest by admitting to others that their answer was just what they had found and that what they believe could be wrong. It was said keeping on chasing the correct answer and believe what one has found could be wrong is a reflection of dialectical thinking. The Chinese cultural tradition of being modest was mentioned here again, but it was not talked about the difference between 'challenging' or 'critique and 'criticizing'.

Here are some examples of what the lecturer said:

在第一阶段批判别人，第二阶段要批判自己。我就经常批判我自己。不要老是看自己正确的东西。一般来说人很难批判自己，会陷入自己的框架中挑不出来。也不是因为不愿意批判自己，是因为看不清楚。所以要克服自己，不断看到自己的不可靠的思想。

Translation: The first step is to think critically about others, the second is to think critically about oneself. I often think critically about myself. Do not always believe that what you think is correct. Usually it is hard for people to think critically about oneself. They will be trapped in their own frame. It is not to say that they do not want to think critically about themselves. It is just they cannot see clearly. So there is a need to overcome oneself, by seeing one's own unreliable thoughts.

It feels that a bit more explanation was needed because asking students to believe that what they believe is wrong is a paradox itself. What is more needed is a way to find a balance between these contradicting points. How to manage preserving the truth and at the same time believe what I have preserved may not be the truth? Dialectic philosophy was quickly mentioned but it was not introduced properly. It was said that this module will focus on how to use CT to write a thesis then, generally any type of academic dissertation. This saying indicates that dealing with the balance between correct or wrong answer or not was out of the scope of this module.

6.2.2.4 Part 4: Reasons and good reasons

It was taught in this part that an argument is based on premises. The function of premises is to provide reasons to make a conclusion convincing. An argument may involve more than one reason. The reasons can be used in different structures. What was taught in this module was called the T and V structures. In a T structure argument, a few reasons jointly prove the truth of the conclusion. The conclusion can only be true if all the reasons are true. In a V structure argument, each reason supports the truth of the conclusion independently. As long as one of the reasons is true, the conclusion is true. Reasons can be obvious or latent and therefore there is a need to recognize the sentences used as reasons. The words such as “because”, “since”, “therefore” can mark the reasons. Sometimes, the reasons are written together with the premises and conclusion without using these marker words. In this case, there is a need to decide if the sentences written near the conclusion can support the truth of conclusion. The teacher reminded that if the sentences close to the conclusion are just explanation of the topics involved in the conclusion, they cannot be regarded as the reasons or premises.

Classifications of different types of reasons, features of different types of reasons and how to recognize bad reasons can be learnt in this part as well. It was taught that reasons can be facts or principles. Facts were classified as the statistical data and the personal experiences. The advantage of

statistical data is that it can involve larger amounts of events, so conclusions following from this kind of reason can be more universal. Survey and questionnaires are common sources of statistical data. The disadvantage of this kind of reason is that it has to skip many details to reduce the event into data. The advantage of using experiences as reason is that it includes more details. The disadvantage is that experience can occur accidentally and therefore be less reliable. In research, observation and interview were two common sources of this kind of data. The lecturer reminded students they need to take care of the advantage and disadvantage of these types of reasons in their research design. This reflects that one of the purposes of this module was to guide students to do research. It was also said that the students will need this knowledge when writing their graduate thesis.

Taking principles (原则) as reasons was said to be more complicated, as principles can be commonly or personally believed. Different groups of people may have different ideas of what is common sense. What is commonly agreed can also be influenced by culture, such as religious beliefs. A practical use was taught here. That is in speeches knowing the belief of the audience and making an argument taking their beliefs as the premises can make the argument more convincing.

Some typical examples of false reasons can be learnt in this module. These typical examples relating to misjudge the reason can be classified as appealing to emotion and appealing to authority. It is noteworthy that emotion was talked about as a negative term again.

Below are what the lecturer said in class:

我们这个课就是多讲讲常见的思想上的容易出现的错误。诉诸权威和诉诸情感是常见的两类不正当理由。诉诸情绪又可以分为三种情况。第一个呢就是人们常常用说这个话的人的人品来在当作依据。比如一个人撒过谎就觉得他说的话一定是假的。第二呢就是利用人们的担忧心理。这个最典型的就是保险。推销保险的会告诉人们一些疾病又多么多么可怕，然后人们因为担心到时候没有保障就买了。但是其实得这个病的几率非常小。这里就是说这个推销保险的人利

用乐人们的担忧心理。第三就是利用同情心来作为一个理由。人们普遍容易同情弱者，看着谁显得比较可怜就去同意谁的观点。这是诉诸感情这一大类的常见的三种错误。还有另外一大类是诉诸权威。权威也不能盲目地去相信，好像权威说的就是对的。权威首先他不见得与具体要讨论的问题相关。比如一个数学老师在英语方面的问题上就不是权威。再比如现在很多年轻人都有自己的偶像，像是明星啊成功人士。他们可能是成功的但是他们的经历不见得跟年轻人的具体情况相适应。所以大家应该避免陷入一种'粉丝情节'中。再有就是传统也不能作为一个不思考就接受的理由。不能因为一件事很多人都说了，都说它是这样的就认为它是真的。

Translation: In this course we will talk about common mistakes of thinking. Appealing to authority and appealing to emotion are the two common kinds of false reasons. Appealing to emotion can be divided again into three ways. Firstly, people often take the personality of the speaker as the reason. For example, if one had lied before people may feel his speaking is definitely false. Secondly, taking advantage of people's fear. The most typical example is selling insurance. The seller may tell people how terrible the illness is and then people may buy it because they want to feel secure. However, the possibility of suffering this illness may be very small. Here the seller is taking advantage of people's fear. Thirdly, using sympathy as the reason. People generally feel sorry for the weaker one, who they may tend to agree with. These are common mistakes regarding appealing to emotion. Another type of false reason is appealing to authority. Authority should not be believed blindly. First of all the authority may be not relevant to all issues. For example a math teacher should not be taken as an authority for English questions. For another example, many young adults have their idol nowadays, such as superstars and successful people. These people may be successful but their experience may be not applicable to most young adults. So we should avoid being trapped by the 'fans emotion'. Also, traditions should not be taken as the reason without consideration. We cannot think something is true just because many people had said so.

There are three types of false reasons appealing to emotion. Firstly, The teacher reminded in this module that people often misjudge the reason because of their judgment of the evidence provider's perceived personality (for example, someone is a liar so anything told by this person must be fake). Secondly, people often misjudge because of fear. For example, some insurance company may try to persuade people by telling them how terrible some diseases are, and because of worrying people may buy an insurance without thinking that they may never suffer such illness, so the buyer was taken advantage of by the seller because of fear. This

explanation felt too short again. What was not taught about is that excessive fear may make people spend unnecessarily in acting in a precautionary way, so this example can also be seen as a flawed weighing up of the risk of getting illness without insurance and the risk of paying for nothing. More about how exactly emotion works may be needed when teaching about appeals to fear. Thirdly, people often misjudge the reason because of their compassion. For example, people often tend to support the pitiable people because of feeling sorry for them.

For the type of false reason appealing to authority, it was reminded that the authority of one area may not be authority of another area. For example, a math teacher must not be taken as the authority for answering questions about the English language. For another example, many young adults have role models, such as stars or successful men and women. They may be successful but their experience may not be relevant for a particular young adult. The students were reminded that they need to avoid this "fans emotion", and the students should not do what their models do just because they like them. People should not take traditions as reasons without questioning. People should not take something as true just because it has been said by many people or has been said so for a long time.

After these typical bad reasons were introduced, it was also reminded that people should not have the emotion of anti-authority either. In other words, people should not argue against a claim simply because it is proposed by an authority. Below are some quotes of the lecturer's speaking:

但是我们也不能说只要是权威说的就都是错的，不能为了反对而反对。吵架为了争对错，人和人之间的争论变成感情上的矛盾，不是心平气和地讨论问题。但是这个很难做到，要不也不会吵架了。我们要养成这样的习惯，养成不感情用事地习惯就可以避免矛盾。

Translation: However we should not say everything told by the authority is wrong. We cannot deny just for the sake of denying. When people argue what is right or wrong, the argument may become emotionally conflicted, instead of a calm discussion. This is hard to do. Otherwise people will not fight. We need to form a

habit---- a habit of not associating emotion when we reason about something. In this way we can avoid conflicts.

In sum, this part taught about how to recognize reasons and how to avoid accepting bad reasons. The key topics include using facts through either experience or research or sometimes others' principles as reasons and not using authority or emotion as reason.

6.2.2.5 Part five: Clarify the meaning

What can be learnt from this part of module is that using ambiguous words is a usual way to make bad argument looks like good argument. The lecturer reminded the students that by using ambiguous words, the question could be secretly replaced with another one and the irrelevant reasons may look like relevant. To avoid the ambiguous words, it was said as necessary to clarify the meaning of concept. The meaning of concept was taught through introducing what the intension and extension of a concept were, i.e. the internal properties and the external objects that are applicable of a concept. Same to the Western definitions that intension is the features that constitutes its formal definition; and extension is the range of applicability of the particular concept (Bahm, 1946), it was also taught in this module that the intension is the essential attribute of a concept and the extension is the collection of the referent objects of a concept. A concept can include several sub-concepts which mean a subset of the referent objects respectively. In this way, a concept can be understood as having hierarchy, and the extent of the sub-concepts (the original Chinese word used in this module was ' 子概念 ') are included in the extent of the concept of a higher hierarchy (属概念). What was said as being needed to be paid attention to in argument is that the truth of a premise involving a concept can be used as the reason to prove the truth of its sub-concept, but not the reverse. Also, the subset of the collection of the objects was different from a physical part of an object, just like a component of a machine is not the machine and a leg of a table is not a table. Therefore, the truth of a statement cannot sufficiently prove the truth of a component

of this statement, but the truth of a statement involving a concept can entail the truth of a statement involving a sub-concept of this concept.

Some real life examples were provided in the module which was very useful. To illustrate one of those examples: the lecturer said that there were many advertisements saying the products had been checked by some reputable institutions, such as government agencies, but these advertisements did not say "checked and passed". That is to say, the products may have been checked but the quality was found to be bad. The concept "had been checked" was included in the concept of "had been checked and passed", not the reverse. The truth of "had been checked" cannot guarantee the truth of "had been checked and passed". Therefore, the argument made in those advertisements should not be believed.

The lecturer also said that the Socratic Methods of questioning were at the origin of clarifying the meaning of concepts. He explained that questioning others by the Socratic Methods was not polite, was not good for showing respect to others, and was not good for personal relationships. It was said that nowadays the principle of tolerance was advocated. If it is necessary to argue with someone, the best way was said to be letting people find out by themselves. It was presented that the common standard of logic made it easier for people to reach mutual understanding of mistakes in arguments, and using logic as the reason for saying someone was wrong was less likely to hurt his or her feeling than directly saying he or she was wrong. In brief, appealing to logic was taken as a way to be critical of other people politely. Below are some quotes of his speaking:

但是苏格拉底那种诘问的方法呢在日常应用当中可能不好去用的，因为你老去问人家这个词是什么意思、那个词是什么意思，那就不礼貌了嘛，好像是老去问，就显得不尊重这个人。这个对人际关系肯定会有影响。我们日常呢一般还是本着一种宽容的原则，这个意思差不多大家都知道就可以了。

Translation: However, the questioning method of Socrates may be not good to use in daily life. If you are always asking what does this term means what does that term means, it is not polite. It seems that if you are always asking about something, you are not respecting the other person. This certainly will affect personal relationships.

In daily life we usually adopt a principle of tolerance. So as long as the meaning can be generally understood, that is fine.

我们现在经常说要讲证据，要把概念说明确。但是这更多的是一种信念。实际应用当中要是一直去问到底说的是一个什么概念或者说去质疑人家说的东西是不是真的，这是一个很不礼貌的行为。一般差不多呢大家都知道就可以了。然后如果说一个事情别人说的是错的，那可以指出他逻辑上的问题。这就是说呢，不是我想说明你错了，而是逻辑上你错了。这就只是一种客观的错误，就不会太伤人的感情。论证要求基于达成共识的理由。这在现实中其实很难达到，很难达到理由的共识。因为人们认识事物的角度不同，认为什么对什么错，很难有一个客观的标准。信念这个东西模模糊糊的。我们要坚持这种原则，又知道实施它是很难的。

Translation: now we often emphasis the giving evidence and clarify concepts. But this is mostly a faith. In practice if one keeps on asking what does another person mean or doubting if what the other person said is true, that is a very not polite behavior. Usually as long as people can make sense that is fine. And if sometimes a person said something wrong, we can point out his logical mistake. That is to say, I did not want to prove that his or her is wrong. It is just there is a logical mistake. This is an objective mistake. By doing so we will not hurt the other person's feeling too much. Reasoning needs commonly agreed grounds. This is very hard to reach in real life. Because people see things from different perspectives. It is hard to say that there is an objective standard for what is right or wrong. Faith is a kind of vague thing. We need to insist this principle and know that it is hard to perform it.

Being polite is a tradition of Chinese culture that is still important nowadays. According to this tradition, Chinese social actors are not supposed to reject or disagree with others directly but gently by finding an acceptable reason or changing a topic in order to reject an argument by putting off or not answering it (Gu, 1990; Pan and Kadar, 2011). According to the lecturer, it seems logic is used as the acceptable reason to deny a bad argument politely. Making the concept ambiguous can make it easier to secretly change the topic (by switching from one sub-extent to another sub-extent) to leave allowance for rejecting politely. In this way, emphasising this aspect of logic of CT (even somehow equating logic and CT) can be seen as one way to make CT not conflict with Chinese culture but consistent with it.

6.2.2.6 Part six: Evaluate deductive arguments

What a deductive argument is and how to check the validity of a deductive argument were taught in this part. A deductive argument has the feature that the truth of premises guarantees the truth of the conclusion. There is no situation where the premises of the deductive argument are true but the conclusion is false. Some common forms of deductive argument were taught in this module. These forms are syllogism (the original Chinese word used in this module was 直言三段论), the modus (假言三段论) and the disjunctive syllogism (选言三段论).

The teaching content regarding syllogism was focused on sufficiency (the original Chinese word used is 周延性). The lecturer pointed out that the sufficient condition is signified by the word “all” in a sentence. A not sufficient condition uses the word “some” instead. The rules for checking if a deductive argument is valid were established as follows: firstly, a common term must be mentioned in the two premises and this term must be sufficient in at least one premise, so at least one of the premises must contain the world ‘all’; secondly, what is not sufficient in the premises cannot be sufficient in the conclusion; thirdly, if one of the premises is negative, the conclusion must be negative. That is to say, if one of the premises contains “is not”, the conclusion must be “something is not something” as well; fourthly, two negative premises (premises containing “is not”) cannot reach a deductive conclusion. It was taught that the truth of a conclusion can be checked by seeing if the argument is consistent with these rules.

The modus is the kind of argument that contains hypothesis, i.e. If...then..., in the premises. It was taught that there are four forms of modus that are valid: 1. If p then q, p, so q; 2. Only if p then q, q, so p; 3. If p then q, not-q, so p; 4. Only if p then q, not-p, so not-p. The lecturer suggested the students check the validity of of an argument by seeing if the argument can be classed into one of these four forms. If not, it is not a good argument.

The disjunctive syllogism has a pair of premises with either-or relation. The basic form of a disjunctive syllogism is: either p or q, not-p, so q. For checking the validity of this kind of argument, it was also suggested that the students can see if the argument can be expressed in this form. A valid disjunctive syllogism must be one that can be sorted into this form.
It was taught that to evaluate the validity of a deductive argument, the students needed to firstly recognize the premises and the conclusion, secondly identify if it is a syllogism, a modus or a disjunctive syllogism, and thirdly check if argument is consistent with these rules and if the structure of the argument is consistent with one of the valid forms. In this way, the virtue of the form of an argument can guarantee the validity of this argument. These simplified forms involving 'p, not p, q, not q' are taking as the tools for evaluating arguments.

In sum, this part introduced several forms of good deductive inference, and it was suggested to check if a deductive inference is good through checking if the deductive inference is consistent with one of these forms.

6.2.2.7 Part seven: Evaluate inductive arguments

The feature of an inductive argument is that the truth of premises cannot guarantee the truth of the conclusion. Four types of commonly used induction were taught: enumeration (the original Chinese word used in this module was '枚举法'), inference from analogy (类比推理), analysing from statistics (统计分析) and analysing from causality (因果分析).

The lecturer explained that the enumeration is the simplest type of induction. This type of induction adopts the belief that the future will be like the past. These examples were talked about to explain this idea: 1. we think that the sun will rise everyday because we have seen that the sun rose yesterday, the day before yesterday and so on; 2. we may also think that all swans are white because we have seen a hundred white swans. Inference based on this kind of belief, that the future will be like the past, is not conclusive but inductive.

The inference from analogy adopts the idea that the similarity between two cases in some aspects indicates the similarity of them in other aspects. This kind of argument was taught by illustrating its structure by single letters: if s1 and s2 are both a part of S, and s1 has a property of p, an inductive argument can claim that s2 may have the property of p as well. Also, if both s1 and s2 have the property of p, and s1 is a part of S, we can inductively claim that s2 may be a part of S as well.

Inference from statistics adopts the idea that people can describe a population through careful sampling. To illustrate this kind of argument by single letters: x% of *A* has property p, a is *A*, so a may have property p. The larger the x is, the more likely the conclusion is true.

Inference from causality adopts the idea that a correlation can indicate a causal relation between two events. This kind of argument was illustrated by single letters in this way: *B* has occurred after *A* occurred, so *A* may cause *B*.

But the lecturer pointed out that one could never be sure of the claim concluded inductively, but could only judge how strong the reasons were. How strong the reasons are depend on the degree of similarity between the cases used as the premises and the case involved in the conclusion. It was taught that the degree of similarity can be judged depend on the homogeneity and the heterogeneity. Homogeneity means using typical and general cases in the premises and this typicality can inductively prove that what happens to these cases is likely to happen to other cases as well. Heterogeneity means collecting various types of cases in order to make cases involved in the premises as diverse as cases involved in the conclusion. This diversity can inductively prove what happens to these cases is likely to happen to other cases. It was also reminded that homogeneity and heterogeneity are what the students would need to concern in research designing and the students would need to use these ideas in their graduation thesis.

In sum, this part teaches several types of inductive inferences and how to make an inductive argument stronger. The topic of uncertainty is involved in this part since the core of induction is that the truth of the premises cannot guarantee the truth of the conclusion, but little teaching was devoted to why and how induction has such features or how to decide what to do based on the inductive but not conclusive argument. Relatively the normative forms of induction took up most of the teaching content.

At the end of the semester students were asking questions about the forthcoming examination and how they should prepare for it. This is the only time I saw the students asking questions voluntarily. The lecturer answered that (quotes)：

这个不用复习啊, 这个课是提高大家的一种思维的质量，提高一种素质。不是考记住了什么的。
Translation: there was no need to prepare for the exam as the module was to improve the quality of thinking. So the exam would not test what students have remembered.

The examination of this course included only multiple choice questions, such as asking the students to choose the right conclusion based on certain premises. Another part of the lecturer's answer was quite interesting. He said that CT is a quality that the students either have or do not have. If a student do not have such quality, studying in this module will not help him or her and for those students who have such quality, studying in this lecture will not help them improve either. By saying so, the lecturer was actually admitting that this CT module was not helpful for students' CT. So he was pretty critical about his own teaching. As he told me once in an informal chat, CT module should be taught in small size discussion class instead of large size lecture-based class. He had also said so in class. Below is what he said in class (quoted with permission):

素质教育课啊和传授知识的课不一样，传授知识的课好像有一些比较规范的做法。按照批判性思维课这个素质教育课的形式的话呢，我们应该有更多的互动性，但是在我们这个课上呢比较难实现。应该小班教育，现在这么多人，根本

就没办法有这些能力去做这些事情。所以我们怎么让大家进来参与到活动中去，我们通过一些练习。我们可以有两种练习。一种是测试型的练习。这个难度在出题的设计，我要想一些好的题目，使得你们选出来的正确和你们的能力匹配。你们就做选择题就行了。还有一个就是开放性的，但是我们没有这个能力和条件去组织这样的讨论。你们可以自己去组一些小组，因为我们是一个全校性的课。你们可以自由去组小组，不要超过 10 个人，这样大家可以更多地讨论。人太多了容易太乱。现在这种教学形式啊，各个大学都不一样。到底怎样真正达到让大家提高，这个是很难去决定。大家可以在课外去感觉一下，自己上完课之后的提高，然后我也不怕大家说我，大家可以来跟我说一下。我们这个课程主要是告诉大家一些经常在思维上犯的错误。

Translation: The quality education/liberal education courses are different from the courses that deliver knowledge[2]*. The courses that deliver knowledge have some normative methods. As this CT course is a kind of quality education, we should have more communication. But it is hard to do so in this course. We should open small size classes. However, as there are so many students, it is impossible to do so. So how should we proceed? We can use exercises. There are two ways to do exercises. The first is to do homework of multiple choice questions. The difficulty of this way is designing good questions that can reflect your ability. You just need to answer the questions. The other way is a more open style. We do not have the resources to organize discussions, because this is a selective course for the whole university. You can organize discussion after class by yourselves. No more than 10 people per group. If there are too many people the discussion may be disordered. Nowadays the method of teaching varies between universities. It is hard to decide whose teaching method is better. You can feel if you have improved after having this course. I'm not afraid of being criticised. You can tell me how you feel. This course mainly teaches some common mistakes of thinking.*

Perhaps the lecturer was critical about his own teaching because he believed that there should be more discussion and only teaching knowledge of logic and reasoning was not helpful for cultivating CT. However, adding discussion may not be the only way to improve CT teaching. As will be written in the next two sections, some teaching content of this module can be improved too.

[2] Quality education courses or liberal education courses are generally explained as a kind of courses that value the cultivation of comprehensive aspects, including ability and morality, instead of only delivering fixed knowledge claims (Yin and Zheng, 2001).

6.3 The teaching content regarding critical thinking disposition and the relationship between reason and emotion

In the West, the ideas of CT include both the knowledge and skills of reasoning and the disposition to perform such skill. However, this CT module heavily focused on the knowing how to reasoning while little mention was made about the aspect of disposition. That is to say, a key content of CT in the West was neglected. Certainly, the nurturing of CT disposition needs cultural and social supports, which is beyond what teachers can do. But the attitude and value imparted to the students through introducing these ideas is also a part of the construction of culture. Therefore, having a fuller understanding of this aspect of CT can be inspiring. What is more, CT disposition and CT skills and knowledge have been found to be positively correlated with each other (Facione, 2000; McGrath, 2003). That is to say, the students' improvement in the aspect of CT disposition can contribute to their improvement in the aspect concerning logic and argument.

In this CT module, little mention was made about the positive value of emotion too. As can be seen from the teaching content, emotion had always been talked about as a negative term by indicating that emotional beliefs could not be used as the evidence, people should not accept a claim because of emotion, a good critical thinker should not be emotional, etc. All these sayings imply an impression that emotion is something we should avoid being influenced by. It seems the idea that emotion can distort reality (Sundararajan, 2015) is accepted deeply in this module. Nothing positive had been said about emotion in this module. It feels that emotion was said to be at odds with reason, since reason was always encouraged while emotion was always discouraged. However, in the West, emotion and reason have been found to be inseparable by both psychologists and brain scientists (Damasio, 2006; Goleman, 1996; Pinker, 1997).

Disposition is one aspect of emotion as emotional experience is why people are disposed to behave in certain ways (Schwarz, 1990). Since emotion can contribute to reason and CT disposition can contribute to CT

skills, adding more teaching content regarding the emotion aspect may be conductive for cultivating students' CT. On the contrary, simply discouraging emotion may not be conductive to cultivating CT disposition either. The students may be not "in the mood of being critical" as they were not supposed to have a mood at first. In this CT module, disposition was not hidden but it was seldom talked about. However, the discussion regarding emotion in this CT module was little and one-sided. Therefore, the understating of CT disposition and criticizing of emotion may jointly discourage this mood of being critical. Actually, cultivating CT disposition has been seen as a hard work not only by Chinese teachers but also by Western teachers (Hayes, 2014). This may be a hard work but realizing the positive aspect of emotion and the relationship between emotion and reason is a start. After all, we cannot avoid the fact that people feel differently when they find something is right and when they find something is wrong, when they agree and disagree with something. A way to manage these feelings may be more useful than directly discouraging them.

In addition, the role of intuitions in reasoning is another positive potential of emotion. Intuitions are formed based on people's whole experimental learning, including physical and emotional experience (Dylan, 2010). They provide people with a much quicker judgment then logical reasoning (ibid). Judgments made based on intuitions are usually abstract, unconscious, and not verbalize, but this kind of judgment is made based on the universal perception (a perception that combining all previous experience) of people (Dewey, 1891). What is more, thinking based on the universal perception fits the tradition of holistic thinking of China and other Asian cultures (Buchtel and Norenzayan, 2008; Sundararajan, 2015). Since emotional experience is unavoidably influencing people's perception which can automatically direct people's intuitive thinking, introducing the content regarding influence of emotion may be needed in modules of CT.

6.4 The teaching content regarding being neutral and uncertain conclusions

Scholars in the West have also generally claimed that CT is not to think negatively about everything. This CT module apparently adopted this idea but this module always talked about it quickly and modestly as if the lecturer was unsure about such idea either (his voice became lower and there were ...humms... in his speaking which makes his sentences not coherent and continuous). As can be noticed through the teaching content of this module, being neutral had been emphasised but it was not specified if this a value-neutral or topic-neutral or something else.

Also, it could be noticed that the lecturer frequently talk for the both sides. When he talked about the authority, it was said that the people should not accept a claim simply because it was said by the authority but people should not reject a claim simply because it was said by the authority either. In this way, believing the authority and not believing the authority are both talked about, but how to deal with an argument from authority was not talked about. It was taught that an authority in one area should not be blindly taking as the authority in another area (and this is the only way to deal with authority argument taught in this module), but an argument from a relevant authority should also be critically thought of. Yet nothing was taught about that, so how to think of an argument from authority remains an uncertain question. For another example, when talked about preserving the truth and the correct answer, it was said that people should preserve the correct answer but it was also said that people should believe that their answer could be wrong. In this way people are again left in a place in the middle of being certain about their own answer and not being certain, remaining open-minded to the opposing claim and remaining confident in one's own claim, but how much confidence can people have in their own answer was not clarified.

This teaching content relating to being neutral and speaking for the both sides can be seen as reflection of supporting considering two opposing points. However, the teaching content regarding the conclusion did not give a clear guide about how to reach a position weighing the opposing points. When it was taught about checking the truth of a claim or

assertion, it was taught how to recognize a conclusion and how to recognize assertions involved in a conclusion. It was also taught that a conclusion involving contradicting sentences entails that this conclusion was false. But if we are perfectly clear about what the conclusion is and this conclusion does not contain contradicting sentences and logical flaws, there may still be many other things to consider not only if the conclusion is true or false but also if the conclusion is acceptable or not. When taught about inductive reasoning, it was taught that inductive reasoning can only produce strongly supported conclusions but not a definite true conclusion. But what to do next when we know a conclusion is not conclusive? The distinction between absolute certainty and enough certainty should be taught about. It was not taught about what to do with the conclusion when one counter example was found either. Perhaps, for example, even though one counter example can be found, it cannot overthrow the overall conclusion or may be together with the other not-counter examples one can concluded in some other ways.

According to many Western CT definitions, alternative explanations are important content of CT. This idea involves drawing a new conclusion based on additional evidence. The new conclusion may work for both the counter example and the old confirming examples. In this way two sets of opposing examples can be combined together. The scientific reasoning involving alternative explanation, best explanation, additional evidence and uncertainty are also useful methods for deciding how much confidence one can have for a conclusion. In addition, the dialectical method involving establishing the truth through reasoned debating involving two (or more) different points of view is similar to this speaking for two opposing sides and find a position in the middle. Dialectical thinking was actually mentioned in this module, but just by listening to the lecture it was not clear how to deal with the opposing points of view exactly. Certainly, CT does not mean to always believe 50% of point A and 50% of point B. It is again a hard task to make a unique and reasonable decision considering various points of view and may be an even harder task to decide how much confidence one can have on his or

her own conclusion. Nevertheless, integrating more knowledge regarding alternative explanations, best explanation, additional evidence and uncertainty when talking about being neutral can be a start.

Certainly, adding the knowledge stated above is not the only way to improve CT but by doing so the module can provide a more complete knowledge of CT comparing to the knowledge contained in Western scholars' work. There are other things that are important for understanding the whole tradition of CT in the West. For example, there is the freedom of speech and value pluralism which are accepted norms in the West which offer a secure environment to develop CT and challenge traditions (Wilson, 2010; Kuyel and Glover, 2010; Crowder, 2006). Establishing these norms obviously is conductive for cultivating CT but Chinese students and lecturers may be uncomfortable with these norms since they are related to cultural political legacy. For practical teaching activities, adding those knowledge points, is likely to be a very doable approach because it is based on philosophy and logic. Considering the fact that in many Chinese universities CT modules are opened in philosophy schools and taught by lecturers with logic background, this approach to improve CT teaching is compatible to the indigenous education system and can make best use of it.

6.5 The teaching content regarding Chinese culture and critical thinking

As reviewed in the literature review in chapter three, many have claimed that Chinese traditional culture has made it difficult for Chinese students to adopt CT but some also claim that Chinese traditional culture may not affect education nowadays. This research therefore chooses the CT module offered by the Chinese university that has the longest history to observe, for seeing how a module can emphasise Chinese tradition and CT at the same time. It turns out that actually the lecturer had severely reminded the students not to adopt conformity, believing what many people believe without questioning and appealing to authority. These Chinese traditions were said to be bad for cultivating CT by both

Western and Chinese educators, so they were also critiqued in this module.

Not all Chinese traditions were critiqued in this module. Being polite and modest was also part of Chinese traditional culture (Gesteland, 2012; Pan and Kádár, 2011). Different from the traditions of conformity and appealing to authority, the traditions of being modest and polite were frequently emphasised through this module. In this way CT is now being emphasised together with the Chinese traditional values. As a result, how to manage the balance between being critical and being polite and modest may be a new challenge faced by Chinese students today. One way to do so, as suggested in this module, is to use logic as the common standard.

6.6 Conclusions

In this chapter I have written about findings through the participant observation in the CT module at Peking University. Through reviewing the seven parts of knowledge introduced in this module, it was found that rich knowledge about logic and making argument had been taught, such as how to identify assumptions, how to check truthfulness of evidences, how to discover logical fallacies and what rules of making inductive and deductive inference are. However, there are some elements of CT defined in the West were hardly introduced in this module. This mainly includes the aspect relating to CT disposition and some elements that can be used for understanding the uncertain conclusions. As a result, for the CT aspect related to conclusion, this module introduced how to decide if a conclusion is false or true, but it did not teach about how to decide if an uncertain conclusion is acceptable, i.e. making decision under uncertainty. However, deciding to what degree a conclusion is possible and acceptable, and deciding when to stop doubting is important knowledge in the literature written by Western scholars. Another finding is that emotion, which is intertwined with disposition, is explicitly discouraged in this module. Differently, in the West some psychologists and brain scientists have found that reason and emotion are inseparable (Damasio, 2006; Goleman, 1996). Seeing in this way, educators can

hardly develop students' reason yet restrict their emotion. Last but not the least, it was found that being polite when using CT had been emphasised in this module. This can be seen as evidence showing the influence of Chinese traditional culture which emphasises 'Li' (politeness).

For integrating the knowledge relating to CT disposition into teaching, the relationship between emotion and reason may be helpful for find a proper way to manage the relationship between CT disposition and CT knowledge. For integrating the knowledge relating to making decision under uncertainty, theories relating to additional evidence, alternative explanations and best explanation (a way to understand how some conclusions are temporarily correct by seeing the conclusions as being the best explanation rather than being right) can be helpful. More about these suggestions will be written about in the discussion in chapter eight.

Chapter 7 Research Findings of Discussion on Internet by Students with Higher Education

7.1 Introduction

This chapter presents the research findings about how Chinese university students talk about CT on social media. It contributes to the thesis by analysing how Chinese students, who are the learners in KT activities, talk about CT in a natural environment in which they are free when talk about anything regarding CT, and are not constrained by a classroom environment.

The Renren website was chosen as the source of data because it is a popular network platform among Chinese students. In 2005, Renren was specially created for university students to build up a bridge to communicate with their current or old schoolmates (Qiu, Lin and Leung, 2013). An important feature of the Renren website is that it was set up in such a way that only IP addresses within the areas of universities can log on to it (ibid). After 2006, this website was opened to IP addresses in areas outside universities, but according to the report of the China Internet Network Information Center, the majority of Renren users are still university students or university graduates (Chinanews, 2010). Nowadays, many researchers working on university students' activities on social networks view Renren as the most popular communication method between Chinese university students and use posts on this website to analyse university students' opinions of various topics (Gao UJ, 2014; Wang YJ, 2014; Gao B, 2012; Xu Y, Chen Y and Deng SJ, 2012). Because of this background, I chose the Renren website to collect posts mentioning CT. The reasons are that firstly if some Chinese students were going to discuss CT online there is a good opportunity they will use the Renren website. Secondly, since university students make up the majority users of Renren, it can be expected that the majority of the posts on Renren were written by university students. It was reasonable to expect that many discussions regarding CT posted by Chinese university students could be collected from Renren.

By checking the profiles of the writers of the posts, this expectation is confirmed. There are 891 posts on Renren mentioning the term CT. These posts were written between October 2ed 2009 to June 20th 2015. All of these posts are open to the public and not password-protected. These posts were analysed by repeatedly reviewing and coding the themes in the posts. I found that there were 271 posts presenting the writers' learning, understanding or opinion of CT. According to the writers' profile, which is open to the public too, these writers are all university students or graduates. So, many posts mentioning CT written by Chinese university students or graduates were found on Renren. As introduced in chapter four, thematic analysis was used in this case study. These posts were analysed by reading and highlighting their themes. The main themes discussed in the blog posts were extracted. Through this analysis, how Chinese university students understand CT is found. Also, some students' difficulty with CT and how some students may have learnt CT by themselves by reading CT books and articles will be covered in this chapter.

There were 620 posts that were irrelevant as they only mentioned CT but did not discuss CT, for example, there are posts saying 'I lost my mobile in the CT class, did anyone see it?' or 'Can anyone tell me the room number of our CT class?'.

7.2 Posts about critical thinking modules

There are 93 posts on Renren discussing CT modules which opened at various universities. These posts were all written by university students, according to the writers' profiles on Renren (their profiles are also open to the public). Within the 93 posts, there are 20 posts asking if these CT modules were good in general (these posts and the translation can be seen in appendix 2.1). In Chinese universities students often ask other students who have taken a module before about their perceptions of an elective module in order to decide if they want to take this module themselves. Since these CT modules are opened as elective modules in most universities, and the posts were written to communicate between schoolmates, it is possible that these 20 posts were asking for others'

experience of the CT modules because the writers were considering picking these CT modules. Some of these posts also show that the writers were concerned about the assessment even before they selected these modules. The themes include the difficulty of CT and CT courses, as well as popular books and articles for CT among Chinese students.

Besides, 16 of the 93 posts are looking for teammates (these posts and the translation can be seen in appendix 2.2). The authors of these posts stated that they wanted to make friends with classmates in the CT modules to discuss questions and work as a team and some posts were stating that a student who was good at logic and philosophy of science was wanted as the team leader. There are 22 of the 93 posts indicating the writers wanted to join the CT modules (see appendix 2.3). The writers were: recommending a CT module on the posts; stating they were very happy because they successfully got into the CT elective modules (it is often in Chinese universities that some students cannot get the elective module they like because the module has a limited size; in this case, usually the students will be randomly selected); stating that they were upset because they did not get into the CT modules; stating they were jealous of those who can join this module; asking if someone would give his or her place in the CT modules to them.

The posts in appendix 2.1, 2.2 and 2.3 all indicate an interest in CT modules and want to engage in the module before they took this module. Especially the posts in appendix 2.3, it shows that in various universities there were students who want to take CT modules but did not get the chance to join this module, due to the limited class size. This implies that CT modules were short in supply. Unfortunately these students' posts are too short to say why they found it important to take an CT module.

18 of the 93 posts state that these CT modules were very difficult (see appendix 2.4). The writers appear to feel that they were not intelligent enough and their IQ was low; the module was so advanced that the writers felt embarrassed about themselves; they did not know how to write the assignment paper and would not suggest others to choose this

module; the module sounded important when the writer selected the module but the exercises of this module turned out to be too difficult. All these posts imply that the students feel their CT modules were very hard after they took this module, and these comments were written by students from different universities. This finding indicates a need to make CT modules more accessible in the future. Usually, for Chinese students, if they find a module is hard, they will not blame the teacher for not explaining it clear enough but blame themselves. This is a reflection of the Chinese tradition of respecting teachers. However, the teachers may need to consider the students' absorptive capacity and make relevant changes to promote the students' studying.

Most of these posts did not say specifically why these CT modules were hard, except two posts which spoke more about the writers' particular difficulties instead of only commenting the module as being hard. One of the posts is as follows:

下午考完批判性思维，忍不住想吐一下槽。

最近和舍友苦逼的复习批判性思维，感觉整个学期学的东西还没有这三天学到的多，主要是前面无法系统的看到所有的流派观点。

复习着复习着各种情感就上来了，不仅仅是因为现在随便拿个案例出来，都习惯用至少四种主义至少八个代表人物的观点理论来分析，而是在于讨论的过程中无论你是同意还是反对，都习惯迅速的从对立的立场和对立的角度罗列一大堆理由来反驳，反过来也是。。。。

但是，你要问我有什么观点……

大家的观点就是我的观点，我的观点是一个综合的观点……

恩，咦？怎么感觉越来越像一个整天满口"一方面，另一方面……凡事都要好的方面和坏的方面……"的不痛不痒尸位素餐的形象了……

2012年2月19日

Translation:

After I finished the final exam this afternoon, I cannot help but complain a bit.

Recently my roommates and I have been preparing hard for the CT exam. I feel I had learnt more in the past three days than the whole semester, mainly because I could not systematically see opinions of all (thinking/philosophy) schools.

During this exam preparation I had various feelings, not only because of the habit of using at least 4 principles and 8 famous scholars' theories to analyze any case, but also because in during discussions, no matter if you agree or disagree, you are used to quickly list a bunch of reasons of the opposing side or angle to contradict. The revise the same....

But, if you are asking what opinions do I have...

Everyone's opinion is my opinion. My opinion is a comprehensive opinion...Emm, Oh? Why does it feel more and more like figures who do a perfunctory job, who hold down a job without doing a stroke of work by always saying "on one side, on the other side...everything has its good and bad sides..."

Written on February 19th 2012

This is a very rare post as the writer complains about his CT module (most other writers who find their modules difficult were blaming themselves for not being smart enough). As can be seen, it was written in this post that the CT module taught the students to discuss a question from multiple perspectives but when it was asked what the speaker's point of view was, the speaker's point of view was always one that making no judgment and simply saying both sides have some validity. For this student, this way of always talking for both sides and saying everything has a good side and a bad side was ambiguous and not responsible. This way of thinking was causing confusion rather than making his mind clearer.

There is another post which also complains about giving no conclusion by the lecturer:

老师我最感动的是你教给我的考试之外的东西，记得哲学第一节课全班跟你辩论了整整45分钟关于上帝存不存在，听了各位神人近乎抬杠的辩驳你最后说，要想批评一件事，就要

先了解他。从此启蒙了我懵懂的批判性思维，老师你现在上课大概还是这么发人深省吧～(在淡淡的忧伤中和对@XXX的调戏中)

2014年1月10日

Translation:

My teacher, what touched me most, beside what you taught me about exams, is that in one philosophy module the whole class debated for 45 minutes with you about

whether God exists. After hearing everyone's arguments, which were almost like sophistry, you finally said that if one wanted to criticise something, one needed to understand it. This enlightened my ingenuous/naive CT. Perhaps your class is still so good at enlightening students' deep thinking? (in slightly sadness and teasing XXX).

Written on 2014-01-10

In this post, it was indicated that there was a discussion regarding the existence of God. The post reported that in the end the lecturer concluded by saying to think critically about the existence of God we need to know what God is. The lecturer did not say his opinion about the existence of God. The writer commented that this module was pretty inspiring for CT, followed by a sentence between parentheses saying the writer was writing so with slight sadness and teasing. This sentence between parentheses indicates that the positive effect of this module was said ironically. In other words the writer thought this module was not helpful for CT by having students discuss about the opposing sides and gave no certain conclusion in the end.

The lecturer's speaking is probably not that problematic, at least he is right in saying that in order to criticise something you need to understand it. The question such as 'Is there a God?' is not a question that can be answered with yes or no. Therefore, it does not matter in this instance whether God exists or not, and the important thing is learning to make good arguments about this topic based on CT. The aim should be to improve and sharpen the students' CT in this process instead of reaching a conclusion. I assume this was the aim of this lecturer too. However, this aim seems to be hard to accept for the student who expected the teacher to give a correct answer in the end. When the lecturer did not do that, the student saw all the previous discussions as meaningless. This problem is probably caused by the exam-oriented education, since exams make students perform a certain task. On the other hand, according to the content of this post, perhaps the lecturer did not explain this aim clearly or did not comment how strong the students' arguments were. To understand the student's difficulty, what the student may need to learn is how to reach an answer by themselves and how can they be certain enough about their

own opinion. One way to do so is explain the knowledge of certainty and uncertainty to them in CT modules.

In the West, there is the accepted norm of value pluralism pointing out that those incommensurable perspectives can co-exist independently and people have the autonomy to choose between them (Crowder, 2006). According to the difficulty in understanding CT in these posts, this value may be not popular among Chinese students in practice. Teaching the multiple perspectives to Chinese students as various independent perspectives can make them confused what to do. They may still only be used to draw conclusions based on one perspective. They may want to find an inclusive and holistic answer but not various answers independent to each other. On surface, the students want to learn an absolutely correct answer which is the opposite of CT. However, their writings can also be interpreted as that they need to learn how to reach a conclusion after considering the multiple perspectives. Perhaps what they want to learn is some ideas that can repeatedly guide them in drawing conclusions in the context in which multiple perspectives instead of one perspective are emphasised, probably due to the influence of the West. In fact, neither CT nor the scientific method leads to certainty (Rovelli, 2012). What CT leads to is decision making since its focus is on deciding what to do and believe (Ennis, 1987). So CT leads to making decision under uncertainty. This may need to be particularly explained to Chinese students since they have confusion regarding this.

These posts in appendix 2.4, indicate that CT modules were taken as one of the difficult modules in a few universities. CT was seen as a kind of advanced knowledge and some students were even having a bit of inferiority feeling about themselves in these modules as they wrote that they were not smart enough to adopt CT. However, not many students have written about their difficulties specifically. Only a couple of posts mention the difficulties about considering two opposing sides and the teacher not giving a certain answer. It appears the students felt confused because the teachers' conclusion was vague. This pursuit for a certain answer may be due to the influence of Chinese exam system. These CT

modules were opened in order to change the problem of exam-oriented education, as found in chapter five, yet these modules, as a part of Chinese education, also face this problem themselves.

There are another 21 of the 93 posts contain the theme of passing the exams of these CT modules. These posts can be seen in appendix 2.5. The writers were asking how students would be tested in the CT modules; asking if there would be many pressing assignments; asking if many students had failed the final exam in this module; asking how the credits would be given, i.e. based on a final exam or a paper; asking if the teacher of the CT module tended to give higher scores. There are also posts asking for answers for the assignment and asking if there were some materials they can recite for passing the final exam of the CT module, similar to what I observed in the end of the CT module of Peking University. These posts indicate that students were kind of worried about the credit they will get from this module, which again show the influence of exam-oriented education. Considering the posts mentioning how difficult these CT modules were, probably the students were worried about their credit because they felt they may fail the final exam.
In sum, these posts mentioning CT modules indicate that there were students in various universities who were interested in their CT modules, but there were also students who had studied these modules and found these modules quite difficult, and some were worried about their exams. The only difficulty that was spelled out was regarding considering opposing sides and reach uncertain conclusion. Therefore, how to understand the uncertain conclusions needs to be emphasised in future teaching.

7.3 Posts about personal understandings of critical thinking

There are 68 posts (see appendix 2.6) which discuss what CT is or why CT is important. These can be seen as the writers' personal understanding and reflections on CT. According to the writers' profile which they choose to open to the public, these writers were all students at Chinese universities. 34 posts (see appendix 2.6.1) wrote that CT involved: using logic to make good arguments; requesting proof for making a point and

reaching a conclusion; analysing and making inferences; paying attention to assumed evidence and logical fallacies. 10 posts (see appendix 2.6.2) also said that CT was not to accept whatever is told by others; CT was not to follow what most people said; CT was to ask questions and be curious; CT was to not to take what is written in the books as gospel truth; CT was not to simply believe what appears on surface. These posts indicate that CT involves a tendency of doubting. By contrast, there are 24 posts (see appendix 2.6.3) stating that CT is not always about doubt. These posts pointed out that CT was not always focused on contradicting all that is told by others; CT was neither to believe so easily nor to disagree with everything; CT was not to always doubt the books; CT was to doubt oneself; CT involved rethinking and doing self-examination profoundly; CT included both to understand others' points and defend one's own point; CT was to think independently when there were multiple voices for one issue.

These posts indicate Chinese university students have associated logic, doubt (but not to doubt everything) and questioning with CT. The association regarding logic also includes the content about requesting evidence, making inference based on the evidence and making an argument. The association regarding doubt includes the content of doubting others, doubting oneself, as well as not doubting sometimes. It seems Chinese students have accepted the idea that CT is not just contradicting and criticizing. This idea of doubting but not always doubting is complex as the two parts of this idea appears to be controversial. Some Western scholars of CT have written about additional evidence, alternative explanations and best solutions which provide important guidance for when to stop doubting. These insights are useful for explaining why should people doubt sometimes and should stop doubting at some other times. However, these insights were not mentioned in the posts.

Alternative explanations involve the idea that different conclusions can be gathered based on the same evidence, and the best solution or best explanation involves the ideas of pursuing a conclusion that is the most

plausible and reasonable one based on the available evidence (Lipman, 2003; Ennis, 1987). Also, according to the Duhem-Quine thesis, testing a hypothesis always needs to be based on one or more assumptions, usually called auxiliary assumptions (Miller, Vandome, Mcbrewster, 2010, b.; Gilles, 1993). As a result, there must be a point when people accept the premises commonly instead of doubting the premises endlessly. In other words, there needs to be a time when people stop discussing additional consideration about the premises. These ideas are useful in deciding when to doubt or stop doubting. Following this idea, when to stop doubting can be understood as that: people may not want to doubt the others' conclusion when they cannot think up other explanation; people may not want to doubt the others' conclusion when based on the evidence that is available (there may be both supporting and contrary evidence so people also need to be conscious that they need to weigh them), such conclusion is the best; people may want to doubt the others' conclusion because there is additional evidence so what was the best conclusion before is not the best anymore; people may want to doubt others' conclusion even if the conclusion is based on good evidence and correct reasoning process because there are alternative explanations.

The aspects regarding additional evidence, alternative explanations and best solution are hardly developed in Chinese HE context though they have been discussed by many Western CT scholars. Since some Chinese students seem to accept the idea that CT requests people to doubt but not always doubt or doubt everything, they would need to know why sometimes people need to doubt and why sometimes they need to stop doubting. Otherwise, this encouraging doubting and not doubting at the same time could cause confusion and not knowing what to believe. In fact, as will be written about in chapter eight, the discussion about the relationship between doubting and following routine has been an important problem among philosophers of science, for example, Popper and Kuhn.

What can be noticed here is that the CT content adopted in these Renren posts is quite similar to the teaching content of the CT module I observed

at Peking University even though these posts were written by students not only at Peking University but many other Chinese universities, perhaps because their CT modules are similar to the typical one I observed. The CT module I observed mentioned the topics of considering opposing sides, CT is not always contradicting and criticizing, and CT involves doubting one's own beliefs. However, the mentioning of these topics was pretty rushed and much more time was spent on introducing logic and making arguments. Not much teaching was dedicated to the question of how to settle between two opposing sides or the content regarding additional evidence, alternative explanations and best solutions. According to these posts, there were also students in various universities who had accepted the idea that CT is not criticizing, a real good critical thinker should do self-examination and should not always doubt a point which contradicts his or her own point, and at the same time did not think up the CT content regarding additional evidence, alternative explanations and best solution, which are exactly what can guide as a standard for finding a balance between opposing points and doubting but not always doubting or doubting everything.

The overlap of the missing elements in the CT module and the Renren posts indicate that this missing element may be not only missed in one university but in other Chinese universities as well. Since this missing content is a common problem and can solve a complex point involved in CT, integrating this content should be helpful for better cultivating CT in Chinese HE.

7.4 Posts about critical thinking disposition and the relationship between reason and emotion

Like the CT module at Peking University, CT disposition was only slightly mentioned in these posts too, as there is only one posts sharing the California Critical Thinking Disposition Inventory. There are 6 posts discussing the role of emotion in CT. These posts can be found in appendix 2.7. These posts wrote that emotional words could make people to be bad at thinking; CT taught people not to use emotion to make judgment but use reason; learning that CT made people act based on logical reasoning instead

of feelings; people should try to make judgment without being influenced by emotion; people who cannot think well would be controlled by their feelings; people could improve their CT by thinking through logic instead of feelings; relying on feelings prevented people from engaging in CT; it was wrong to appeal to emotion; people should not judge others' saying because of emotion. As can be seen, all of these posts discuss negative aspects of emotion in the context of CT. These posts commonly emphasise how emotional appeals can make an argument fallacious and take emotion as if it is opposed to logic and rationality. This is again quite similar to what happened in the CT module I observed where students had been reminded that emotion was a problem to avoid.

7.5 Posts about relevant books and articles

There are 51 posts recommending books entitled as CT. These books were recommended with very short comments saying they were good or useful. No negative comment for the books has been found. These books include:

1. *Asking the Right Questions: A Guide to Critical Thinking* by Neil Browne and Stuart Keeley (recommended 31 times);
2. *Critical Thinking* by Brooke Noel Moore and Richard Parker (recommended 13 times);
3. *Critical Thinking: Tools for Taking Charge of Your Learning and Your Professional and Personal Life* by Richard Paul and Linda Elder (recommended 2 times);
4. *Critical Thinking in Psychology: A Unified Skills Approach* by D. Alan Bensley (recommended 2 times);
5. *A Coursebook in Critical Thinking* by Gu Zhenyi and Liu Zhuanghu (mentioned 2 times);
6. *Thinking: An Interdisciplinary Approach to Critical and Creative Thinking* by Gary R.Kirby and Jeffrey R. Goodpaster (recommended only once).

All these books contain knowledge about how to make good arguments, including knowledge regarding premises, logical rules, and drawing and judging conclusions. Besides, these books also contain some different ideas. The first two books above, which were recommended far more often than other books, contain more practical strategies than other books.

The book *Asking the Right Questions: A Guide to Critical Thinking* by Neil Browne and Stuart Keeley talks about the strategy of how to discover clues in research and the book *Critical Thinking* by Brooke Noel Moore and Richard Parker talks about techniques to persuade people, for example, using visual images. These two books also involve the emotion and disposition aspect of CT by talking about the relationship between thinking, feeling, intuition, morality and ethic. If Chinese students read these books carefully, they may have a more complex understanding of emotion instead of simply seeing it as negative. However, most of the posts only shortly commented these books are good and there are only a couple of posts talking about what the writers of the posts thought they had learned, which both talk about the link between CT and logic but not disposition or the relationship between feelings and reasoning. So it is not clear if these students had learnt this content. The posts talking about the writers' learning are as follows:

	Time of the post	*Relevant information in the posts*
Posts recommending the book of Asking the Right Questions: A Guide to Critical Thinking by Neil Browne and Stuart Keeley		
1	*2014-07-30*	*《学会提问——批判性思维指南》读书笔记 笔者希望从最简单的逻辑出发，对一系列观点进行批判。在此过程中，将常见逻辑错误归类。 (Notes made during reading this book. The author starts from the simplest logic to think critically about a series of opinions. In this process, common logic errors will be classified.)*
2	*2013-12-09*	*中学时走女文青路线，上大学后，深感缺少批判性思维和逻辑思维能力，经多方大神推荐和一年学习，有所进步，分享书单。爱问均有电子书，书非借不能读，一次勿下多啦！After I entered this university, I deeply feel I lack logic and CT. Based on recommendations of various outstanding scholars and learning for one year, I have made process. Below I want to share my reading list. 1、＜学会提问----批判性思维指南＞2、...*

There are two other books that were recommended twice. They both contain some negative terms, perhaps this is why they were shared fewer

times than the former two books. The book *Critical Thinking: Tools for Taking Charge of Your Learning and Your Professional and Personal Life* by Richard Paul and Linda Elder discusses the order of the world after the World War II and how important it is to develop CT to face the threats, challenge and cruelty in life. The book *Critical Thinking in Psychology: A Unified Skills Approach* by D. Alan Bensley discusses how to think critically about questions in psychology including selfishness and sexual abuse. Perhaps the low recommending rate in these books imply an unwillingness to face the crisis brought about due to lacking CT.

The book *Thinking: An Interdisciplinary Approach to Critical and Creative Thinking* by Gary R.Kirby and Jeffrey R. Goodpaster is the only book that focuses on CT and creative thinking, which is related to the national education plan of developing innovative talents. This book introduces CT and creative thinking through presenting ideas of philosophers, scientists, psychologists, etc. in different periods of history. This book was only recommended once, perhaps because this book includes too broad a content.

The book *A Coursebook in Critical Thinking* by Gu Zhenyi and Liu Zhuanghu was actually recommended only once too because one of the two posts mentioning this book was selling this and some other books without saying any recommending words. Beside knowledge of making arguments, this book also contains several articles written by famous Chinese writers in 1930s, to exhibit excellent examples of critical writings. Except for the book written by Gu Zhenyi and Liu Zhuanghu, which was used as the textbook for the CT module I observed, all the other books were written by American authors. The book by Gu and Liu is not the only Chinese textbook in CT. As pointed out in chapter five, the lecturers of the CT modules of Renmin University and Huazhong University of Science and Technology have also written CT textbooks. It is just that these textbooks have not been mentioned on Renren, which implies that CT books written by Chinese authors were less popular than those by

American writers, as few Chinese students had recommended them voluntarily.

The CT books by American authors have been translated into Chinese and these Chinese versions of these books were recommended in the posts. This indicates a heavier influence of American ideas on Chinese students' understanding about CT compared to other Western countries. What should be noticed is that these books contain the ideas of alternative explanations, best solution and additional evidence, and CT disposition. For example, in the book *Asking the Right Questions: A Guide to Critical Thinking* by Neil Browne and Stuart Keeley there is a section on alternative thinking styles (pp 3-5). Therefore, these ideas may be read by some Chinese students, and so these ideas may be not entirely missing. However, the posts recommending these books did not mention these terms in particular, nor did any other posts. So it is still possible that these ideas did not receive attention among most Chinese students.

There are 50 posts re-tweeting articles on Renren that were published on newspapers or journals. The articles include:

1. '牛津大学校长：中国学生欠缺挑战教授的能力'. This is a piece of news reporting the chancellor of the University of Oxford Andrew D. Hamilton's speech on a Chinese-Foreign University Presidents Forum presenting Chinese students were lacking the ability of challenging professors (shared 10 times);
2. '耶鲁校长：大学教育，不可缺失对于批判性思维的培养'. This is another piece of news reporting the former President of Yale University Richard Levin's speech on the same Chinese-Foreign University Presidents Forum saying that CT is lacking among Chinese students (shared for 6 times);
3. '中国学生参加美国高考仅 7%及格 缺乏批判性思维'. This is a piece of news reporting that only 7% of Chinese examiners passed the SAT tests and this failure was because of lacking CT (shared for 4 times);

4. ‘颠倒黄白 批判性思维哪里来’. This is an article discussing how to develop CT. The article claimed that training of logic is necessary for cultivating CT. This article was published on a newspaper named *South Weekend* (南方周末). Only one post shared this article.

5. ‘六论“思想解放” 批判性思维不可缺’. This is an article discussing how CT is necessary. The article claimed that CT is lacking in Chinese culture. This article was published in the journal Yan Huang Chun Qiu (炎黄春秋). Only one post shared this article.

As can be seen, these articles tend to claim that CT is lacking among Chinese people. The writers on Renren who shared these articles did not provide any comments, indicating if they agreed or disagreed with this specific claim.

Some of these articles are not entitled as CT but mentioning CT:

6. ‘中国教育扼杀创造力’. This is an article written by the Dean of Economics and Management School of Tsinghua University, Qian Yingyi (钱颖一). It is written in this article that Chinese education bias (the word used in this article is ‘扼杀’ whose literal translation is kill) CT and creative thinking. This article was shared by two posts.

7. ‘提出好问题是创新第一步’. This is an article written by a member of the Chinese Academy of Sciences, Zhu Bangfen (朱邦芬). It is written in this article that asking good and deep questions is the key for creation and the reflection of having CT, yet imagination, curiosity and CT are lacking in Chinese education. This article was shared by two posts.

8. ‘十大阴谋论~~件件离奇’. This is an article published by *China Daily,* which writes about 10 events in American history, such as the murder of the President Kennedy and the 9.11 event. It is written in this article that the plots in these events may inspire people’s CT. This article was shared for 21 times, though no comment was made.

9. ‘奥巴马开学演讲：《我们为什么要上学？》’. This is a transcript of a speech made by the American President Obama in the opening ceremony of a high school, which includes the content of

encouraging the students to develop CT and observing skills in their social science classes. This article was shared for 3 times.

As can be seen, these articles shared among Chinese university students tend to claim that CT is lacking among Chinese people (including students). The writers on Renren who shared these articles did not provide any comments about if they agreed or disagreed with this specific claim of the articles. But since these Chinese students shared these articles it may indicate that Chinese students have a general impression that CT is their weakness (corresponding with the posts above saying that they are not smart enough to adopt CT), as university leaders in China and the West said so about them and because of the exam-oriented system, Chinese students used to value their teachers' evaluation very much.

The books and articles entitled as CT mentioned on Renren posts indicate that some literature created by Western authors, especially American authors, may have been read by Chinese university students. However, as the number of the post is small, it is hard to know how influential these works on Chinese students' understanding of CT are. As a result, these readings can only be used as a piece of preliminary information implying what materials may be popular among Chinese students. If some scholars are interested in teaching CT in China or to Chinese students, they can use this reading list as a reference when choosing textbooks for their students.

7.6 Conclusions

There are 271 posts presenting opinions about CT modules or reflections and understanding of CT. It can be seen from these 271 posts that firstly there are some posts written about CT modules indicating the students' difficulties in CT, especially in understanding the importance of considering opposing sides in an argument, which is one of the core topics of CT. Secondly, some posts written about personal understanding and reflections of CT show that argument, logic and reasoning are frequently used to define CT but the understanding of another core issue

in CT, namely to be neutral, remains problematic. A fair judge should avoid taking sides (being neutral) until have listened to all arguments, but after hearing the arguments the judge needs to decide which side to support. What is more, arguments have directions, intentions and aims. Just like science is not absolutely neutral when the problems of 'who to benefit?' or 'what problem to solve?' are involved (Goldsmith, 2000). Being neutral in value is only one aspect of being objective (stanford.edu). The difference between being unbiased and neutral needs to be clarified. Thirdly, there are a few posts written about CT and emotion but similar to the CT module I observed, they all mention the negative influence of emotion and none of them mention the link between emotion and reason. Lastly, this chapter lists some books and articles recommended between the students.

It can be seen from these posts that there are students interested in the CT modules at various universities but there are also students in various universities who felt the CT modules were too hard to understand and the difficulties include understanding the uncertain conclusions.

Regarding the personal understanding of CT, it can be seen from the posts that logic, reasoning, making arguments and rationality are all associated concepts of CT but again the contradiction between doubting but not doubting everything remains unclear. There are both posts presenting that CT encourages doubting and posts presenting that CT discourages doubting everything, but no post had discussed the balance between them. As a result, to what extent should people remain sceptical about the conclusion may be a question that is not clear for the students. The Renren posts seem to lose sight of the part of CT dealing with when to stop doubting and deciding what to believe or do under uncertainty. In addition, emotion was seldom mentioned and only talked about as a negative influence.

These discussions of CT is similar to the teaching content of the CT module I observed which also overlook making decision under uncertainty and the link between emotion and reason. The fact that the

CT module I observed and the discussions of CT by students in various universities had missed the same content in return prove the missing knowledge of the CT module I observed is likely to be a problem of the CT modules opened by some other Chinese universities. Since the students from other universities did not discuss about the knowledge either (and there is a confusion related to this issue), it is possible that these pieces of knowledge, or elements of CT, are also missed in their CT modules as well. That is to say, the elements regarding making decision under uncertainty and link between emotion and reason can be commonly understated in Chinese CT modules. In other words, it can be seen that these elements of CT are what had been omitted in the process of transferring CT from the West into China.

What is important is that these elements are not an insignificant part of CT. It is not likely that decision makers of Chinese HE would want to omit these elements either. After all, in most of the cases people would encounter uncertainty and can hardly make an either-or conclusion. In the next chapter, I will discuss how these elements of CT have been covered by Western critical thinkers and how these elements of CT are practical and useful for solving problems even more than logic and inference. I will also discuss about how some knowledge regarding scientific thinking (which is generally celebrated in Chinese political and educational environment) and the relationship between emotion and reason can be helpful for better cultivating CT, especially for achieving the goals of the MOE, including to encourage students to think independently, to promote innovative and creative thinking and therefore to built world-class education.

Chapter 8 Discussion

8.1 Introduction

Based on the findings in the former three chapters, this chapter will discuss the question how the different sources of evidence tell us about the construction of CT in Chinese HE. This chapter will firstly look at how the findings of the former three chapters reflect the construction of CT in Chinese HE and how this construction reflects the four influential factors in KT studies. Secondly, based on how the knowledge of CT had been constructed in China, how understandings of CT in China is different from knowledge of CT contained in Western scholars' works will be discussed and two tentative suggestions will be made for how policy makers and educators might want to continuously implement and teach CT to Chinese students either in China, UK or other countries. One of the suggestions is integrating more knowledge regarding additional evidence, alternative explanations and best explanation into CT teaching. The other suggestion is adding more knowledge regarding specific effects of emotion instead of seeing it as simply negative.

8.2 The knowledge of critical thinking constructed in Chinese higher education

According to KT studies reviewed in chapter two, the decision maker, access, culture and background knowledge are the 4 influential factors in KT process. Decision makers can influence how the learners get access to the knowledge and the access influence the learners' scope of the knowledge. Here the access can be understood as what makes the knowledge available to the students or what connects the learners with the knowledge. University modules or curricula are therefore one type of the access. Other actors involved in this KT process are students, who can be seen as general learners. Following these KT studies, the MOE, as the decision maker, can influence CT modules in Chinese universities, including the typical CT module at Peking University, and CT modules in Chinese universities can influence Chinese students' understanding of CT. The meanings of CT held jointly by Chinese social actors involved in this

KT process can be seen as a construction of CT in China, since the overall understanding of an object of event by people in a society can be seen as a kind of social construction (Hurwitz, 2009).

The sections below will discuss the relationship between findings involving the MOE, the CT module at Peking University (the typical CT module) and Renren posts, and explore the influence of one of them on another. In addition, how the MOE's documents mentioning CT, teaching content of the CT module and Renren posts mentioning CT reflect influence of Chinese culture and pre-existing knowledge will be discussed.

8.2.1 The influence of MOE as the decision-making authority

As presented in chapter five, MOE documents provide reasons for why MOE values CT and why they want CT to be taught at Chinese universities as well as information about which universities had opened CT modules. By doing so, the MOE constructs CT in China by emphasising that CT is important for developing innovative and creative talents, as well as independent learning and building world-class HE in China. Thanks to the MOE's construction, CT is no longer a strange term in China but a preferred education ideal and part of the national education plan. The MOE also contributes to the construction of CT in China by supporting university leaders to visit foreign universities to learn advanced experience and advocating universities to open CT modules by informing these universities' reports to the public. These CT modules also construct the ways through which most Chinese university students can get access to knowledge of CT.

According to various KT studies, the decision makers' goal can influence what content will be emphasised when learners are given access to the knowledge. In this case study, however, it seems the MOE's (the decision maker) goals did not influence the teaching content directly. In chapter five, three explicitly stated goals of the MOE were mentioned: 1. promoting innovative thinking (which is mentioned most frequently), 2. building a world-class university system and 3. encouraging students to engage in independent thinking. These goals were not frequently

mentioned in the CT module I observed. Instead, the value of CT that was frequently mentioned in this module was letting students know how to critically write a paper.

The reason may be that this research did not distinguish between high level policy goals and their implementation in practice which may be left to be decided by lower level bureaucrats, such as curriculum developers and teachers. Chinese government used to have full control over what is taught in universities but since the education reform in 1985, designing curricula is the autonomy of universities and their teachers while the government only supervises the overall result (Guo, 1995; Ryan, 2011). A reflection is that more and more modules are being designed independently by schools. Until 2014, about one third of the modules were designed independently by the schools of universities (Tan, 2014). The rest were designed by the central government or local governments in provinces (ibid). These CT modules appear to be one of the school designed modules, considering that teachers are using different textbooks, often written by the teachers themselves, in different universities. Therefore, the relationship between the MOE and the CT module is not totally identical to the relationship (the aspects of the knowledge that is valued by the decision makers will be particularly facilitated through the access) between decision makers and the access in the KT studies reviewed in chapter two.

Since the teaching content of these school-designed modules is not decided by the government, the goals of the MOE may not be specially emphasised in these modules. However, since the autonomy of universities is restricted by the national plan (Guo, 1995), it is plausible that the goals of the MOE and modules are the same. In fact, among the MOE documents mentioning CT is important for developing innovative talents, there are two documents which are reports by Peking University. In these two documents, CT is also mentioned as part of the university's plan for developing innovative talents. So Peking University also sees developing innovative talents as the reason for which CT is valued. The goals of letting students form their own understanding in learning and becoming a world-class university are also mentioned in these documents. Since the

goals mentioned in Peking University's reports are consistent with most of other documents published by the MOE, the reason these high level goals were seldom mentioned in the CT module is not that the goals of valuing CT of the MOE and this university module are different.

Another more possible reason may be that these high level goals of the MOE are very hard to implement. In Western HE systems, there is also the difficulty in linking the high level goals and their implementation in practice. In the West, the high level goals include those focusing on improving intelligence and thinking ability and therefore producing better talents of creativity, problem-solving and decision making abilities (Bartels, 2013; Davidson, 2013; Gardiner, 1995), as opposed to having students remember facts, passing exams and finish tasks which are often regarded as not ideal teaching methods. However, in practice, educational policy makers often found that implementing these high level goals is difficult, since these goals involve many steps that are not always under their control and cognitive abilities that are hard to be observed or evaluated (ibid). As can be seen, one of the reasons why the MOE values CT, i.e. developing innovative talents, is identical to the high level goals of creativity in the Western education system. This is again a reflection of the internationalization of Chinese HE according to Western education. What is more, it seems Chinese HE is facing the difficulty implementing these high level goals into daily teaching, too. In short, Chinese HE has been learning from Western HE and is facing the similar difficulties faced by Western HE institutions.

It is understandable that in everyday teaching the teachers would want to talk more about a visible goal, a goal whose realization can be observed by their students, colleagues and leaders. Enabling students to critically writing a thesis can be seen as an observable goal. As a student's paper is something people can read, the improvement of CT is somehow materialized. In other words, the MOE had been transferring CT for a goal but the exact relationship between developing CT and this goal is hard to be seen. So for the MOE, further clarifying the relationship between CT and innovative and creativity thinking may be needed for measuring the

success of cultivating innovative talents. On the other hand, for universities, this finding indicates that in future CT teaching, teaching content that can further explain the relationship between CT and innovative and creative thinking in practice shall be appreciated by Chinese teachers and university leaders, as by doing so the teaching will stick more closely to the national education plan.

Although it can be generally said that MOE has the power of shaping education in China, in practical teaching, there is more kinds of power that needs to be considered, for example, the situation of state power in China. Using harmonious language is necessary in Chinese society (Wang and Juffermans, 2016). This habit of speaking reflects both the norms of being sensitive to politeness and avoiding conflicts (Feng, 2007; Zhou, 2006; Zhang and Xie, 2010). However, it also reflects interventions of state power since alternative voice and heteroglossia, i.e. having different points of views of the same issue, are seen as against harmony and morally inappropriate (Jacka, Kipnis and Sargeson, 2013; Wang and Juffermans, 2016). Since maintaining networks is necessary for most social activities in China (Prigogine, 2015), conforming to these norms is necessary for social life.

The effects of this social context could be observed during the fieldwork, since the lecturer said that he hoped to use some news as examples to illustrate how to analyse but said this was not convenient. Below are some examples of what the lecturer said, showing a limitation of the freedom of speech:

最近我也没有看到比较合适的例子。因为中国社会这个例子比较难举，自然的例子很多的，但是有些例子太敏感，不方便说的。我们以前有一些比较合适的例子，但是最近没有比较合适的例子。但是我们主要是说这个例子要说明的道理，这个例子本身是造出来的还是编出来的其实并不重要。讲完这些。。。废话啊，我们回到我们的课上。

Translation: I have seen proper examples to be discussed in this course. Because in China giving examples is hard. There are many events, but they are too sensitive to be used as examples. It is not convenient to talk about them. We used to have some proper examples but not now. However, the purpose of introducing examples is to

illustrate the reasoning. The examples themselves, no matter if they are made up or not, is not important actually. After talking about these...nonsense talking, let's come back to our course.

为什么说举国外的例子比较好呢？因为国外的例子都是讲名人的。你看美国，哪个总统上台就议论哪个人。在国外名人是没有隐私的，他的隐私是要受监视的。比如他们撒谎啦，家庭怎么样啦，这些在一般人可以原谅的问题在名人身上就不行，因为对名人的道德要求更高。所以举国外例子就可以举那些名人、专家。但是在中国举例子只能举小王、小张。这样是为了避免冲突。
Translation: Why is it better using examples from foreign countries? Because those examples are about famous people. In foreign countries the famous people do not have privacy. Their personal conditions are under the supervision of the public. For example, they lied, their have problems with their family, etc. these problems are fine with normal people but not for famous people. Because there is a higher requirement for the morality of famous people. However, for Chinese examples we can only use examples of nick names, such as Xiao Wang, Xiao Zhang. This is to avoid conflicts.

The lecturer also often reminded the students to be polite when applying CT. He also tended to emphasise being critical to oneself, stressed that CT is neutral and was somehow reserved when talking about challenging authority.

These phenomena also indicate the limitations of freedom of speech. It has been claimed that the autonomy of education in China has given teachers much more freedom in deciding how to teach the course (Wang and Shen, 2017), but it may not be so when it comes to organizing students to discuss about famous politicians or businessmen, or articulating alternative voices about news on political or economic decisions. And this is an issue that should be particularly considered in future CT education.

If limitations to alternative voice can be observed even in CT classrooms, it can be expected that they are also influential to applying CT outside classrooms. The lecturer had said that his course was about knowledge of CT instead of application of CT. That is to say, the students may find what they learnt about CT are not doable in practice. This can certainly reduce their enthusiasm. In a hierarchical system where the power of making decisions, policies and rules are controlled by authorities of various levels,

one will often feel that thinking critically about others' opinions is a far worse idea than building relationships, i.e. Guanxi/关系 (Zhao and Timothy, 2015). As a result, for pragmatic reasons, one may think that CT is not useful. This social context indicates difficulties of promoting CT education in China.

8.2.2 The influence of the CT module as an opportunity to access

University modules construct CT in China by providing relevant knowledge to students. As reviewed in chapter two, many KT studies found that the access which makes the knowledge available to the learners can influence what the learners will remember, understand and adopt. Following this literature, the knowledge provided by those CT modules also influence Chinese students' understanding of CT. Due to the limitation of time and resource, I only choose one typical module to research. This CT module was severely limited to issues of logic, such as checking premises, clarifying meanings of concepts and recognizing and judging others' claims and conclusions, while at the same time excluding some important ideas in Western CT scholarship. Such teaching content may impart relevant understanding to its students, which is that logic is the main body of CT. Yet, the teaching content may impart an ambiguous understanding about being neutral and making decision when confronted with opposing and multiple perspectives. This appears to be a salient issue that pervades Chinese thinking about CT.

Certainly, though this CT module is typical to some extent, one cannot assume that other CT modules have adopted a similar approach. In fact, as found in chapter five, there are some quite different modules in other universities who offer small size discussing classes for their elite students. However, by reviewing Renren posts written by students from various universities (including those universities offer discussing classes), it can be seen that these students' understanding and difficulty regarding CT were similar. The students were commonly focusing on logic when talking about CT, just like they did in the typical CT module I observed. The

students' confusion appears to be surrounding dealing with multiple perspectives, which were hardly talked about in that CT module either.

The Renren posts also show the same attitude towards CT disposition and emotion with the CT module I observed----emotion was always discouraged and CT disposition was hardly discussed. Since the writers of these posts, despite coming from various universities, understand CT in the same way, it is possible that their CT modules share common ground with the CT module I observed. At least, the research findings show that this CT module and other CT modules are similar in focusing on logic, missing uncertain conclusions and CT disposition and simply discouraging emotion, though they may vary in teaching styles.

In other words, the CT modules provided access to materials regarding logic but excluded other aspects, such as how to deal with uncertainty (caused by multiple concerns) or disposition, so the students had an understanding of logic but not uncertain conclusions or disposition. If university modules only give access to materials that talk about logic, it may restrict the students' knowledge of the broader meaning of CT. This finding implies the significant effect of teachings in universities on students' learning. When certain Western knowledge is spread in Chinese HE, the university modules have heavy influence on the students' scope and understanding of this knowledge. Take CT for an example, if we ask a Chinese student what CT is, he or she may say that CT is logic, being rational and not always doubt (because these were emphasised in their modules), instead of deciding what to do or believe, weighing up pros and cons and doubting by proposing the alternatives (because these were not emphasised in their modules).

Beside the access to CT knowledge provided by modules in Chinese universities, there is another problem with Chinese students' attitude toward knowledge worth consideration. Chinese educators find that many of their students think learning knowledge is not important. The reflections of this attitude are that more and more students are skipping classes, not paying attention in classes, only working hard for passing the

exams and forget the knowledge after the exams (Jiang, 2015; Yao, 2014; Yin, 2014). The reason of this attitude is that students feel they cannot acquire the ability they need in future work (ibid).

The phenomena of skipping classes and asking what can be recited for passing the exam can also be observed in the CT course at Peking University and on Renren posts. Since this is a phenomena that can be observed in Chinese universities generally, linking CT courses with real life activities, especially with students' future work or job hunting may be a way to promote CT education.

Since the implementation of the enrollment expansion, university students are generally under the pressure of being unemployed after graduation (Xing, 2014; Yao, 2014). Therefore, students expect that there can be some courses linking their study with their future work, their learning with their practice and are helpful for their job hunting. In this context, entrepreneurship education (创业教育) and employment education (就业教育) are now offered in universities (Cao and Zou, 2014) and MOE had released relevant policies (for example 教育部办公厅关于建设全国万名优秀创新创业导师人才库的通知；教育部办公厅关于促进 2016 届尚未就业高校毕业生创业就业的通知/Notice of the General Office of the Ministry of Education on Promoting the Talent Pool of the National Excellent and Innovative Entrepreneurship Instructors of the Ministry of Education of the People's Republic of China) to support graduates to seek employment or self-employment through selecting supervisors to help students make career plans and advertising relevant laws and regulations. In this process, a function of CT education is guiding students to clearly think about his or her knowledge, skills and abilities and the needs of job positions, as the abilities of the students and the job positions are information that needs to be analysed as well. To match one's abilities with jobs and positions, analysing such information is a necessary step. In choosing which work to do, students will definitely encounter advantages, disadvantages and different situations in which they need CT to make decisions.

8.2.3 The influence of culture and background knowledge

According to the theory of KT, culture and background knowledge will also influence how the knowledge is constructed in the recipient unit. In this thesis, the influence of these two factors can also be seen.

As reviewed in section 2.3, though CT has been frequently described as a shortcoming of Chinese students (Qian, 2011; Li, 2011), there are actually quite some contributory factors for adopting CT contained in Chinese classics, such as Taoism. However, there is an important aspect of Taoistic logic which is different from the logic developed by Aristotle. Aristotle develops what has been called Aristotelian logic based on two laws, that of contradiction and that of the excluded middle (Standford Encyclopedia of Philosophy, 2011). This logic was regarded as laying the foundation for science (ibid). Differently, Taoist logic uses the Yin and Yang symbols which means that it is only because of comparing to Yin (the negative) that Yang (the positive) can be seen as Yang (Karimi, 2009). In other words, it is only because of comparing to what is wrong that what is right is right. No wrong side, no right side. Therefore, the dichotomous and contradictory poles are coexisting (ibid.). This idea challenging dichotomy can also be seen in the famous Taoism sceptical paradox and story of 'Zhuangzi Dreamed He Was a Butterfly' in which Zhuangzi questions the possibility of distinguishing waking from dreaming (Graham, 1981). This is an evidence showing the reflective thinking about people's mind in Chinese history, but it also shows how Chinese tradition of skeptic involve coexistence of contradictions.

This well-known paradox again indicates the influence of the Taoism idea of linking the dichotomous and contradictory poles among Chinese social actors. Chinese traditions tend to never disagree with something absolutely and hold that nothing is false for certain. In addition, the dialectical logic of Buddhism or Taoism and Monism all reflect co-existence of dichotomous and contradictory poles (Gao, 1987; Xu, 2013; Yuan and Zhou, 1998). The idea of co-existence of dichotomous and contradictory poles plays a very dominant role in Chinese scientific

thought. As a result, disagreeing with something decisively may be odd to Chinese social actors.

The influence of this kind of tradition can be observed in the CT module opened by Peking University, since the lecturer frequently remind the students to consider opposite opinions. This habit of recognizing the opposite opinions is actually a general habit among Asian students. It is found in recent psychological studies that Western Students (American, Canadian and European) tend to make stronger arguments when reading statements that contain false conclusions, while Asian students (including Chinese) tend to make weaker arguments and notice the merits in that conclusion rather than seeing how it can be wrong (Nisbett, 2004). This psychological finding shows that a tendency of being neutral is adopted by Chinese students. a higher degree of disposition towards CT is collectively held by Western student than Chinese students, since the tendency of engaging in arguments demonstrates a higher disposition of CT (Facione, 2007; Glaser, 1941). Therefore, the particular influence of Chinese culture on CT may not be pushing students to believe in authority blindly, but encouraging students to find a standpoint in the middle of two opposite claims.

The works of Taoism also contain ideas of questioning one's own belief and knowing but only through abstract stories. For example, the story of 'The Debate on the Joy of Fish' in *Zhuangzi* discusses the question of how can one knows that the fish is happy and the story of 'Zhuangzi dreamed he was a butterfly' discusses the question of how can one knows that he is not dreaming (Graham, 1981). Therefore, *Zhuangzi* can be seen as a Chinese classic talks about thinking reflectively about one's knowing.

Besides, Needham identifies a sceptical tradition in Chinese history. However, this tradition is largely used in criticising beliefs of pseudo-science, such as Astrology or ghost tales. For example, Wang Chong, who was a philosopher in the 1st AD, made great efforts to dispel the superstition and mysticism contained in Confucianism and Taoism. Wang tried to explain natural phenomena in naturalistic ways. For example, he

showed that thunder was caused by 'fire' rather than being an manifestation of the anger of the heaven. However, as commented by Needham, Wang Chong's work was destructive about Taoism but he did not propose an alternative theory better then the Yin Yang theory of Taoism, otherwise Wang can make greater contribution to Chinese thinking. That is to say, Wang critiqued a way of thinking which is based on the Yin Yang theory, but he did not propose another way of thinking.

As can be seen from Needham's work, Wang and other skeptics in Chinese history only questioned the beliefs of superstition but did not discuss how these beliefs, as one type of false beliefs, are formed. They have not started a tradition of questioning one's knowing and beliefs, but just that the certain kinds of beliefs, in particular those of ghosts and heavens, are fake. As a result, their sceptical tradition cannot make mass Chinese social actors be familiar with the idea of thinking reflectively of beliefs and knowing. Also, this sceptical tradition was not mainstream thoughts in Chinese history, and only drew attention of a small group of people and were not taken as classics through Chinese generations (Gao, 1999; Wu, 1990). As a result, scepticism, as the idea that one's belief needs reasons, was not made popular in Chinese knowledge base.

If we define scientific method as a reliable way of thinking (Okasha, 2002), then thinking reflectively about one's own beliefs and clarifying the ground based on which our beliefs are formed is necessary a part of scientific thinking. Therefore, in CT teaching, some Chinese classics, especially those of Taoism, can be used to familiarize Chinese students with certain ideas of CT but teachers need to explain in what sense is CT linked to these classics. However, in the CT module I observed, the roots of CT identified by Western scholars, such as the sceptical ideas in *Zhuangzi* or Wang Yu's work were not mentioned. They were not mentioned in the CT module I observed or in the MOE documents and Renren posts.

That is to say, not all background knowledge related to CT in Chinese classics are being used to promote CT teaching nowadays. Logic appears

to be the part of Chinese classics that are influencing Chinese students' and teachers' adoption of CT, since the focus on logic in the CT module and on Renren posts corresponds with the focus on logic in Chinese classic works. Logical rules were used as a way to make CT be compatible with Chinese culture of politeness. Based on the common logical standards, finding others' logical flaws was taught as a way to critique others objectively without attaching others personally. This construction of CT reflects the feature of Chinese culture as it suggests how to make CT compatible with being polite.

8.3 The differences between knowledge of critical thinking constructed in Chinese higher education and in Western scholars' works

8.3.1 The difference in the knowledge about dealing with uncertain conclusions and multiple perspectives

In the CT module at Peking University, it was found that being neutral and considering opposing sides had been emphasised, but how to make a point despite being neutral or how to find a balance after considering both sides were not explained. On the Renren posts, the students (who were in different universities) also wrote that they understood that CT is a neutral process in which they need to doubt but not doubt everything; however, when to stop doubting and draw a conclusion was not written about; as a result, it seems this content was not explained in their CT modules either. That is to say, the lack of this explanation (how to reach a conclusion despite of the multiple concerns) appears to be common among Chinese CT modules. In other words, the teaching of CT in China has included the content that CT is to think negatively, but does that mean the students cannot disagree with something firmly, strongly and determinedly? The discussion about this question remains elusive, which can be seen as a missing element of current CT teaching.

What is important is that this missing element can lead to confusion. In fact, the only problem that was spelled out by the students' posts was related to these missing aspects. On the Renren posts, there were plenty of

students who complained that their modules were hard to understand and the only specific reason was that they felt they were taught to make ambiguous conclusions and they were taught to consider multiple viewpoints together. This confusion can be understood as follows: For example, there are viewpoint A and viewpoint B; if the students simply accept viewpoint A while thinking negatively about viewpoint B, then they will automatically have a clear conclusion about what to believe or do. If the students cannot think negatively about either viewpoint A or B but need to consider the validity of both, they will not automatically have a clear conclusion. Considering the validity of multiple viewpoints can lead to making better decisions, but it may firstly make people feel uncertain about which conclusion is true or right. The CT modules in Chinese universities did not focus on how to reach a conclusion after having the multiple concerns. This can make the students think that considering multiple viewpoints is simply putting them together, i.e. not disagreeing with any of them. In this way, the students can easily be confused about what to believe or do. There seems to be an assumption behind the students' concerns that in principle there is a right answer to such questions. This seems to be a problem in their attitude which may be due to the Chinese culture, or to the nature of philosophical logic.

They were taught not to accept the automatically clear conclusion, and yet they do not know how to draw a conclusion by themselves either. This can explain why there are some students who complained that their teachers were being ambiguous.

Certainly, CT cannot be reduced to disagreeing with everything and CT asks people to consider multiple perspectives including the opposite, as taught in both the CT module I observed and other CT modules (according to Renren posts, the students who wrote these posts must had been taught so in their CT modules too). But CT also involves learning to make decisions about what to believe and do. Therefore, reaching a conclusion can be seen as the final goal of practicing CT, instead of endlessly wandering around with various concerns in mind. Having a second thought is an important process but making a decision (as everyday

decision in life) is the final goal. The CT modules in Chinese universities appear to be focused on teaching this important process but not the final goal. The problem is that without teaching about how to draw a conclusion, being neutral and having multiple concerns can simply become an obstacle for making decisions, instead of being a bridge to making better decisions. Therefore, how to draw a conclusion after having multiple concerns should be an important topic for discussion in CT modules.

Considering the fact that being innovative and creative is the most important reason of the MOE for which CT is valued, deciding what to believe based on existing materials is relatively less important for CT teaching in China according to official policy. As creativity does not always mean making decisions but also means having a divergent thinking which is similar to having multiple concerns (Hennessey and Amabile, 2009). However, creativity is both a kind of ability involving divergent thinking and a kind of socially recognized achievement (Barron and Harrington, 1981). To realize the latter meaning of creativity, which is creating to make contribution to society, not only divergent and multiple thoughts are needed but also synthesizing multiple concerns and deciding what to create to solve a particular problem or achieve a particular aim. In Western universities, divergent and convergent thinking are both important thinking abilities (Moore, 1987), probably due to the reason that only those who both having multiple thoughts and knowing how to make a decision based on these thoughts can really become creative, or innovative, talents who can contribute to society efficiently.

In short, since the teaching content of various CT modules appears to lack such explanation of how to draw a conclusion synthesizing multiple concerns and the only specific confusion written about by the students is reaching ambiguous conclusions (they are related as always having multiple concerns is the reason leads to having no certain conclusion), how to reach a conclusion based on divergent thoughts can be seen as an important problem of teaching CT in Chinese universities.

Solving this problem might help those students who were interested in CT but felt CT was too hard to understand. In the CT module I observed, there were a lot of students who wanted to listen to this module at the beginning, as in the first few classes there were so many students that the seats in the classroom were not enough. However, the classroom became much emptier through the semester. Until the last few classes half of the classroom was empty. Some students only came to sign their names on the attendance list and some students stayed in the classroom but were not listening (some slept in class or watched a movie under their desk). On the Renren posts, there were also plenty of students who found CT and the modules were interesting but hard to understand. CT was even said by some students as something beyond their intelligence. Since CT is a kind of knowledge that the students already are curious and think highly of, what can make CT easier for them to understand could be very popular.

In sum, since being ambiguous in conclusion is the only specific confusion written by the students and the teaching content in various CT modules also appears to lack introduction for uncertain conclusion, solving this problem can be an important step for better cultivating CT. The CT modules in Chinese HE used to teach students to have a second thought but not how to decide after multiple concerns, and therefore may have led to more hesitation rather than wiser decision. In this way, there is a danger in making CT a dogma instead of a liberty of thinking. At this point, solving this problem will be like a completing step for reaching better quality of education. And since making decisions in the presence of uncertainty involves on personal judgment to a large degree, this content is actually important for the quality-orientation education which emphasised developing students' personality and morality (Tan, 2014).

Western-defined CT content regarding alternative explanations, additional evidence and best explanation can be used to solve the problem of ambiguous conclusion by illustrating why in many cases the truth or falsity of a conclusion is uncertain and to what extent the uncertainty can be tolerated. These pieces of content can be emphasised more when teaching CT modules to Chinese students, considering the finding that

these appear to be related to a common confusion highlighted by the students themselves.

An alternative explanation or alternative possibility can be understood as different conclusions that are drawn based on same evidence (Ennis, 1987; McPeck, 1981; Siegel 2001; Lipman, 2003). In other words, being given the same evidence and following the same logical rules, people can reach different conclusions and these conclusions can all have some validity. As a result, which conclusion is right is uncertain. This is how an uncertain conclusion can be reached. The idea of alternative explanations can be used to clarify the confusion regarding how to doubt but not doubt everything. Proposing an alternative explanation is a good reason for not accepting a conclusion. CT supports being sceptical but discourages contradicting everything. Doubting with a good reason can be seen as being sceptical in the proper sense, while doubting without a reason can be seen as simply thinking negatively. Therefore, having or having not an alternative explanation is a line between being sceptical or being negative. When we cannot think up an alternative conclusion, we may want to stop doubting for the time being. When we can think up an alternative conclusion, we may want to start doubting and discuss why the alternative is more plausible.

Additional evidence (either theories or facts) can be understood as new evidence appearing after a conclusion has been drawn (Bloom, 1956; Facione, 2007; Reichenbach, 2001). In other words, there may be evidence not known when the conclusion was reached. CT is a basic component of scientific method and besides arguing against views, changing conclusions upon reflection of new evidence and interactions is a more advanced requirement of scientific inquiry (Zevallos, 2014). Due to proposing additional evidence, people may find that the old conclusion is incomplete and some may call the incomplete conclusion a wrong conclusion (Asimov, 1989). As a result, it is uncertain that the conclusion is right or wrong as ongoing events are producing new evidence as time passes. Additional evidence can be used to clarify the confusion regarding how to hold on to what we believe but can also make us aware

of the fact that what we believe can be wrong. We can believe a conclusion determinedly because it is logically inferred from the available evidence. We can only give up what we believed when new evidence shows up and disproves it. This is how what we used to believe turns out to be wrong. We cannot give it up without solid new evidence. In this way, identifying additional evidence is a line between keeping holding on to a conclusion and dropping a conclusion. We may want to change our conclusion when there is solid new evidence but trust our conclusion when there is not. Otherwise, we may spend too much time on baseless hesitation.

The best available explanation or the best available solution can be understood as the conclusion that has the highest probability to be true among the alternatives (Watson and Glaser, 1941; Paul, 1993; Facione, 1990). In other words, the best conclusion cannot disprove the possibility of alternative conclusions but it is the most acceptable one for some reasons, which can be related to the aim of making an argument. As a result, the truth of this conclusion is uncertain. The best available explanation can be used to clarify the confusion regarding multiple points of view. Thinking about the best available explanation may provide one way to consider how to make our own conclusion after hearing multiple conclusions made by others. We can either make a conclusion combining their merits or choose one of the conclusions by weighing up their probabilities. The key defence to make is clarifying why we have more reasons to believe one conclusion than others. In this weighing up process, multiple conclusions are taken into account but besides the best one, they can only be saved for later consideration, especially when new evidence appears. However, before the probability can be changed, the best available conclusion will be used to make a decision. In short, the conclusion having minor possibility, in other words a slightly likely conclusion, cannot stop us from making decision based on the conclusion having major possibility, in other words a pretty likely conclusion, but we need to go through the process of evaluating what has minor possibility and what has major possibility. We can be determined when there is uncertainty.

Thinking about the best available explanation can also be used to clarify the confusion regarding being neutral and considering opposing points of view. The best available explanation is preferred and regarded as the most possible one because it is simpler or can explain more events than other conclusions (Ennis, 1987; Siegel 2001; Bloom, 1956). In other words, a conclusion is often regarded as the best because arriving at it is more straightforward, it fits much of our observation and there has not been counter evidence against it yet. The idea about the best explanation can help when an opposing claim proposes counter evidence. It demonstrates that how we should change our conclusion depends on finding a new conclusion that can explain both the old evidence and the new counter evidence. Therefore, considering the opposite does not mean simply finding a place in the middle, always admitting that a part of the opposing points are correct whenever we are disagreed with, or unconditionally dropping a part of our conclusion to make place for the other conclusion. In short, being neutral can be understood as finding a conclusion that can explain evidence both for and against something rather than neither agreeing nor disagreeing with any existing conclusion.

In sum, thinking about an alternative explanation, additional evidence and the best available solution can be used to clarify the confusion regarding when one should doubt or stop doubting, why our believes can turn out to be wrong later, and what should we consider after hearing multiple or opposing claims. They can clarify how uncertain conclusions are drawn and therefore can instruct how to deal with uncertain conclusions. Many Chinese university students had written about such confusion in their Renren posts but none of them had mentioned using these ideas (alternative explanation, additional evidence and best solution) to solve their confusion. Also, knowledge regarding these concepts had not been introduced in the CT module I observed, which is a typical one among Chinese CT modules. Therefore, designing an education plan intuitively containing the knowledge regarding these concepts can be helpful for improving the quality of cultivating CT in Chinese HE.

Integrating reform and indigenous education has been a trend of Chinese HE (Ryan, 2011). This section discusses some ideas contained in Chinese classics related to scientific thoughts and suggests that these ideas may be used as metaphors to explain the ideas of additional evidence, alternative explanations and best explanation to Chinese students. These ideas within Chinese scientific thoughts are similar to the ideas of additional evidence, alternative explanations and best explanation (I will explain why I say they are similar in the following paragraphs) and are familiar with by Chinese students (since these ideas are within Chinese classics). Therefore, these ideas within Chinese scientific thoughts can be used as clues in improving CT teaching in the future. Joseph Needham's (1991) studies on civilization of science in China are taken as the core reference in identifying those ideas.

As stated in chapter two, in the second volume of *Chinese Civilization of Science History of Scientific Thoughts,* Needham praises the contribution of Taoism to Chinese science and holds that it is comparable to scientific methods developed before Aristotle's time. The fundamental principles of Taoism can familiarize students with best explanation. "Tao" is an abstract idea indicating that there is a general law for everything in the universe, and people are supposed to observe large amount of natural events to discover what this law is (Needham, 1991, Groarke, 1996; Han, 1992; Lian, 2002). Ideally, this general law is the reason behind everything. Since this principle of Taoism suggests searching for a general law which can explain everything, it can be used to describe the idea that a theory explaining more events is better (in specific, closer to the general law) than theories explaining fewer. Therefore, this principle of Taoism can be used as a piece of background knowledge of best explanation. Through using Tao as a metaphor, best explanation can be easier for Chinese students to understand.

The idea of constant change of the natural world is contained in Mohism and Taoism (Needham, 1991; Pinto, 2001; Peng and Nisbett, 1999). These two classical thoughts were less dominant in Chinese history than Confucianism for social, economical, political and contingent reasons, yet

they contain significant ideas of seeing the world through a scientific way (Needham, 1991; Ronan and Needham, 1982; Hongladarom, n.a). According to this philosophy, the reality is not fixed but continuously updating itself. The philosophy regarding constant change can contribute to familiarity regarding additional evidence. This is a changing world so we have changing (and therefore uncertain) conclusions. Since the reality is always changing, new conditions are always emerging and this could change the conclusions. Therefore, this philosophy can be used to describe the idea that new evidence is appearing as time passing by. In this way, the idea of constant change can work as background knowledge of additional evidence.

There is one important difference between Chinese and Western scientific methods which is related to alternative explanations. According to Needham, a sceptical tradition was visible in Chinese history. However, this tradition was involved in critiquing pseudo-science (such as astrology or ghost tales), and after doubting the existing belief no better ways was proposed to explain those mysterious events. Also, Mohism appeared to be a main pioneer in debating. This philosophy school was very outstanding in finding counter examples and developing the format of syllogism, but the focus of this school was disproving others' claims by pointing out the logical flaws instead of proposing an alternative explanation (Liu and Liu, 2008; Han, 1992; Lian, 2002). Also, Taoism and Mohism hold that contradictions can co-exist with and transform into each other (Needham, 1991; Ronan and Needham, 1982; Hongladarom, n.a). They can be used to describe the idea that a conclusion can be alternated and both the old and new conclusions have some validity. However, this idea is somehow different from the idea in the West which sees scientific theories as refutable and only temporarily correct, because it sees all the true and false are temporarily. As a result, Chinese classics contain little ideas about proposing alternative explanation which is more likely to be correct.

It seems this sceptical tradition identified by Needham indicates that in Chinese history, the content of doubting only contains disproving.

However, in the West, the content of doubting is not only disproving but also proposing another possible conclusion. In fact, finding how to explain the facts alternatively is one of the typical ways of doubting (McPeck, 1981). Therefore, Chinese classical philosophy may not link doubting with alternative explanations (thought it is partly linked to co-existence of contradictions). As a result, asking students to think up alternative explanations after giving them the same evidence may be an exercise in need. The teachers may also want to remind the students that when they ask the students to doubt, they mean both finding logical flaws and finding alternative explanations.

In sum, some ideas involving in Chinese scientific thoughts can be used to make the particular CT content more familiar to Chinese students, for example, some ideas contained in Taoism and Mohism. These two classical thoughts are more scientifically inclined in Chinese history than Confucianism (Ronan and Needham, 1982; Hongladarom, n.a). For teaching international students from China, adding content regarding scientific methods can contribute to their understanding of Western culture too. For teaching CT in Chinese universities, scientific thoughts regarding the general law, constant change and contradictions transforming can be used as the language and metaphors describing CT. By doing so CT is linked with what the students already know through their common knowledge regarding Chinese classics.

8.3.2 The difference in the knowledge about critical thinking disposition and the relationship between reason and emotion

In the CT module I observed, content related to CT disposition, such as attitudes and worldview, was only mentioned in passing while emotion was talked about as being totally negative. On the Renren posts, same phenomena can be seen. Therefore, CT disposition, though not hidden from Chinese students, were understated to a large degree, as CT disposition was put in a much less important position comparing to CT skills/abilities. As for emotion, in everyday life saying somebody is emotional can be generally seen as a negative judgment, but for experts studying CT in the West, emotion are not totally negative. For example,

Ennis (1987), a Western scholar of CT, emphasises the importance of emotion during applying CT. He holds that by analysing one's own emotion, a person can better collect evidence and make decisions. The reason is that a person can analyse why he or she feels so and take that as the evidence; a person can analyse what result will make him or her happy and therefore know what to do. Also, CT includes considering the influence of emotion in people's decision making process (Elder, 1996). Emotion is linked with having passions for following reason and evidence and decide what to do accordingly (Paul and Elder, 2007). In short, emotion is linked with motivation and motivation is what matters for reasoning. Therefore, the attitude towards emotion is different between Chinese and Western critical thinkers. In both China and the West, not appealing to emotion is emphasised. However, Western critical thinkers find that there are times when emotion can have positive influence on using CT to make good decisions while in China emotions are seen as problematic in CT teaching. That is to say, only part of CT content regarding disposition and emotion defined in the West had been adopted into Chinese HE.

Since content of CT disposition had not been introduced and emotion had been simply taken as a negative term, excluding disposition and emotion can be seen as a problem of CT in China. What is important is that excluding this content is not helpful for both CT skills and deciding what to believe or do, as CT disposition and skills, and emotion and reason, are not separable.

Although CT is defined as having two factors respectively involving CT skills/abilities and disposition (Elder, 2013), these two factors are not isolated from each other. There have been studies indicating there is a positive relationship between CT skills and disposition. Profetto-McGrath (2003) found after measuring 228 undergraduates' CT disposition and skills that "there was a significant relationship between students' overall CTS (crtitical thinking skills) and CTD (critical thinking disposition) scores" (p.569). Yang and Chou (2008) found after measuring CTS and CTD of 220 Taiwan undergraduates that overall CTD and CTD are

correlated as students who scored higher in CTD also received higher scores in CTS. Mohd Zin and Wong (2014) found after evaluating 374 Malaysian participants' CT disposition and skills that the disinclination of CT disposition was corroborated with worse performance in CT skills, which indicates that having CT disposition can reinforce the habit of performing CT and subsequently reinforce CT skills. Also, some have statistically found a significant correlation between tests scores of CT and emotional intelligence (Afshar and Rahimi, 2014). These studies show that having better CTD is conducive to having better CTS while having worse CTD is indicative to having worse CTS.

Having lower CT disposition scores seems to be indicative to be less advanced in CT skills. The relationship between emotion and reason is similar----being worse in feeling the emotion lead to being worse reasoning----according to some brain scientists, psychologists, educators and critical thinkers. Damasio (1994) found that patients who got their brain part of emotion (such as the amygdala) damaged were unable to choose the advantageous options and therefore made decisions far from being rational. Critical thinkers have claimed that emotion can reveal information to people and that successful decision making needs to consult both reason and emotion (Elder, 1996; Ennis, 1987; Ennis, 1998). This usefulness of emotion recognized by critical thinkers overlaps with the functions of emotional intelligence found by psychologists, such as collecting information about the context through feelings (for example, fleeing when we feel fear), understanding other people through empathy, and understanding one's own preference for making decisions (Goleman, 1995; Schwarz, 1990; Macmurray, 1999). Educators have also found that making inquiry is an action requiring passions and therefore associated with emotion, e.g. committing to truth seeking involves emotion, and noticing how being rational emotionally felt like can be an important clue for being rational in the future (Bailin, 2011; Sharp, 2007). In other words, there may be a desirable state of mind that is suitable for perform CT well (i.e. how being rational feels like), and CT modules may need to raise students awareness of this state of mind. All the evidence above means that even if teaching cannot directly reach students' emotion and disposition,

teachers should talk about the role of emotion and make students aware of their importance in decision making.

In sum, various studies by brain scientists, critical thinkers, psychologists and educators suggest that emotion is not absolutely negative. Although 'being emotional' can be understood as having one's feelings out of control and may therefore usually be regarded as negative in daily life, among experts focusing on thoughts and CT, emotion have their importance in making right decisions. As a result, for modules or students that focus on discussing CT, taking emotion as being absolutely negative is one-sided. This may also cause losing interests in CT, as people may hardly become passionate about CT if they are not allowed to attach any feelings to it. Considering the relationship between disposition and skills and emotion and reason, putting disposition and emotion aside seems to be disadvantageous for making rational decisions. This calls for a way to adopt content regarding disposition and emotion into CT teaching.

In the book *Doctrine of the Mean*, which is a classic of Confucianism, there is a paragraph mentioning how to understand emotion:

喜怒哀乐之未发,谓之中;发而皆中节,谓之和。中也者,天下之大本也;和也者,天下之达道也。致中和,天地位焉,万物育焉。
Translation: Waiting before expressing one's emotions of joy, sorrow, sadness and happiness is regarded as being moderate. Expressing these emotions to a proper extent is regarded as being harmonious. Being moderate is the greatest foundation of the world. Being harmonious opens the highway of the world. By being moderate and harmonious, the world is in order and all things in the world will grow.

This content of the the book *Doctrine of the Mean* shows that there had been consideration of the reasonability of emotion in Chinese tradition. Emotion is a part of the human nature and therefore it is a part of the nature of the world. Therefore, it needs to be managed, i.e. expressing emotion to a proper extent, but not eliminated. Considering the positive functions of emotion reviewed in the former section, I suggest that there is a need to raise awareness about the importance of emotion in CT

modules. By doing so, these modules can provide guidance for students about how to develop CT disposition as well as how to make a decision. There are three particular pieces of content regarding functions of emotion I want to suggest, including sensing information, being motivated by a purpose and getting to remember what it feels like to be rational.

The function regarding sensing information can contribute to collecting evidence. Evolutionary studies found that emotion had helped human ancestors to survive, e.g. fear transmits information of danger and tells people to flea; anger transmits being challenged and tells people to prepare to fight; disgust transmits being poisoned or infected and protects people's health, etc (Dylan, 2003). What is more, these emotion transmit signs very quickly, much faster than the speed of reason, so people can react immediately (ibid). These findings suggest that giving up the information transmitted by emotion is a pity. Our emotion is caused by some real things, so we would want to consider our emotion and decide if the information indicated by emotion is true and important. For example, when we feel fear we may want to think if there truly are threatens we need to deal with. Therefore, this function of emotion is helpful for gathering adequate evidence from the context, and quicker.

The function regarding being motivated by a purpose can contribute to deciding what to do. The meaning of CT includes making one's own decision for realizing certain purposes (Watson and Glaser, 1941; Paul, 1993; Facione, 1990). Absolutely having no emotion can make people lose their directions and preference and therefore their purposes. An example is that for the patients whose emotion brain parts were damaged, they could not associate desirable or undesirable feelings to events and therefore could not see why some options are more favorable like normal people could; as a result, they could not make reasonable decision (Damasio, 1994). In this way, emotion can be seen as a necessary for decision making as emotion guide preference and purposes.

Certainly, people are not supposed to make decisions based on their emotion either. It is just that people do not have to try to block their emotion, but only beware of the influence of emotion. For example, if people can consciously associate emotion of happiness to something they reasonably think they should do, then they will more intuitively eager to do so and may do so feeling more relax then seeing it as a task/burden they have to do. Feeling happy when doing what things is related to people's value system. The influence of emotion shows the importance of having positive value. What a CT module can do here is introducing how emotion is involved in the decision making process.

Basically, events which brought people joy or suffering can leave a memory in people's mind, and this memory can make people to expect that they will feel the same way when similar events happen again (Dylan, 2003). These memories of previous emotional experience can form people's intuitions which give people a quick, and often unconscious, judgment regarding if certain events are preferred (Evans, 2010; Dewey, 1981). This expectation then works as a motivation for which people want to seek or avoid certain events. Since the happy or unhappy memories of previous experience can motivate people to seek or avoid certain events, emotion is influential in driving people to set aims. In other words, what kind of aim a person wants to seek, what purpose he or she wants to pursue, is influenced by what feelings this person attach to certain events. This is one way to think critically and reflectively about why people want to do certain things, which can be a part of a CT module.

The content regarding feelings associated with rationality can be used for cultivate CT disposition. Emotion and disposition are closely related since people have the disposition to behave in certain ways when they are experiencing certain emotion in their mind (Dylan, 2003, Schwarz, 1990). That is to say, relative emotion is the cause of disposition. Therefore, there should be a kind of emotion intertwined with CT disposition too, which is how we feel when we are thinking critically, when we are checking evidence, following logical rules and making or judging a conclusion. In other words, there is a state of mind we would want to

keep for being good critical thinkers. Psychologists have found that when heartbeat and breath rate is significantly faster, people are likely to make decisions they normally would not (Salovey and Grewal, 2004). This finding suggests that feeling stable is a favorable state of mind. Educators have found that a mixture of surprising and joy can contribute to students' curiosity (Scheffler, 1991; Bailin, 2011), which suggests a combination of these two types of feeling are favorable for seeking explanation behind phenomena. What this state of mind for CT disposition exactly is may be a very difficult question, but at least it can be reminded in CT modules that the emotion we had when performed CT successfully before is a clue for how performing CT will feels like in the future. Remembering this emotional experience can be helpful for developing CT disposition.

Introducing the functions of emotion does not mean that we should follow our emotion without control, but only that emotion is not always negative. We cannot expect that by telling students 'do not be emotional' they will automatically know how to manage that. They may still be influenced by emotion unconsciously. The theories above shed light on influence of emotion and several aspects of emotion which can aid the process of practicing CT. Introducing these ideas can help students better manage and even make use of emotion.

8.4 Conclusions

The aim of this thesis is to study how CT has been transferred into the Chinese higher education (HE) system, how the knowledge of CT has been transformed in this transfer process and how CT is understood by social actors involved in Chinese HE, that is, policy makers, educators and students. Based on the research findings, in this chapter I firstly discuss the influence of the four factors in KT studies on constructing knowledge of CT in Chinese HE. The influence of decision maker on the access was not obvious as the CT module did not mention those goals of the MOE frequently. This finding indicates that in international KT activities, what universities and students practically do is worth more consideration beside the government's intention. Making the transferred

knowledge understandable and doable for the university staff and students is as important as receiving the government's support. The influence of access on the learners can be seen by students' focusing on same aspects of CT with the CT module I observed. This finding indicates that Chinese students' understanding of CT depends on the introduction of the Chinese university modules to a large degree, despite the development of internet and media technology (Matthew, 2005). The influence of culture emphasising respecting authority and advocating collectivism were not obvious, as challenging authority and having individual opinions were encouraged in the CT module, but the influence of culture can be reflected by reminding students to be polite when using CT. The influence of background knowledge can be seen as emphasising logic and reasoning in both the CT module and students' posts, which corresponds to the fact that logic and reason are included in Chinese philosophy classics related to scientific thoughts. However,little effort was made to combine relevant sceptical traditions in Chinese history with CT.

Secondly, the ideas related to understanding uncertainty are discussed in this chapter. Scholars of CT in the West have talked about alternative explanations, best explanation and additional evidence (Ennis, 1987; McPeck, 1981; Hare, 1999). These are the ideas and topics that are contained in 'the knowledge of CT in the West' but not in 'the knowledge of CT in China'. What is important is that these ideas are particularly helpful in describing why some conclusions are uncertain and why some conclusions thought to be true can turn out to be false later. Understanding why some conclusion is uncertain or only temporarily correct can provide guidance about when to be flexible and when to be stable and how can we be sceptical and keep an open mind at the same time. In this way we would not doubt disorderly.

Thirdly, the excluding of disposition of CT and discouraging having emotion are discussed. In the CT module, it was said that disposition, attitude or spirit of CT would not be included, so this knowledge regarding tendency of being critical is missed in the transferring process.

Some previous studies have found that CT disposition and skills were correlated. As a result, finding a way to integrate the disposition aspect into Chinese education will be beneficial for improving students' CT. Potentially, the knowledge of the importance of CT disposition can be imparted by explaining the influence of emotion on decision making more in depth.

Chapter 9 Conclusions

9.1 An overview of the thesis

As a knowledge transfer study, this thesis investigates the transfer of a kind of special knowledge, namely 'critical thinking'. In this thesis, 'the knowledge of CT in the West' means knowledge contained in works of various CT scholars whose nationalities are in Western countries, including UK, US, Canada and Australia; the term 'the knowledge of CT in China' is constructed based on discussions on CT that were made by Chinese policy makers, educators and students. In this way, the thesis studies if and how some ideas by Western CT scholars are adopted or rejected by various groups of Chinese people.

This thesis has found that the construction of the knowledge of CT in Chinese HE is mainly focused on logic and much less attention is given to CT disposition (the tendency and willingness to think critically) and deciding what to do or believe after considering uncertainty and multiple perspectives.

In chapter two, I reviewed KT studies, and according to these studies, the knowledge of CT adopted in Chinese HE aroused my attention. It is very likely that the knowledge of CT talked about in the West will be transformed when they are transferred to Chinese HE, on account of the fact that CT is a very complex knowledge whose transferability has been a controversy among CT scholars. There are four main factors can influence Chinese students' understanding of CT and subsequently influence their CT performance. Therefore, I reviewed definitions proposed by some important Western scholars of CT to compare to see if some ideas involved in these definitions are not adopted by Chinese policy makers, teachers and students.

By reviewing previous literature on CT and Chinese students, which are written about in chapter three, it is found that the majority of current studies are focusing on testing Chinese students' CT through exams and claiming that certain teaching styles, such as group discussion and

problem solving, are more conductive for cultivating Chinese students' CT than lecture-based teaching, which is seen as a tradition of Chinese education. This review indicates that though many studies have accused Chinese culture for being a barrier for Chinese students' CT, few have investigated how cultural conflicts may influence Chinese people's reinterpretation of CT. Since China has been active in joining the internationalization of education which takes cultivation CT as one of the ideals, CT will not be discouraged on surface. However, some accepts of CT may be modified for being acceptable in Chinese context. This phenomena happens in many KT activities.

In chapter four I present the research method I use to study the transfer of CT into Chinese HE. In order to answer the key research question, what knowledge of CT has been transferred into the Chinese higher education (HE) system, I have adopted the KT framework based on which I have identified three sources of information, the MOE, a CT university module and Renren posts which respectively represent the decision maker, the access and the learners in KT activities. Mixed methods of document analysis and participant observation are used to study information collected from these sources. A participant observation was done for one semester in the CT module at Peking University. As regards the studies of the MOE and Renren, texts containing the term CT published on their websites are analysed by thematic analysis.

The research findings of the MOE, the CT module and Renren are respectively written about in chapter five to seven, and in chapter eight a discussion of these findings focusing on the two main differences between CT in Chinese HE and among Western scholars, which can also be considered as two suggestions for how to teach CT to Chinese students in the future.

9.2 Key overall findings and implications

This thesis studies what CT means to social actors involved in Chinese HE, that are, policy makers, teachers and students. It studies if and/or how the

knowledge of CT constructed in China does not adopt some aspects of CT that was proposed by some scholars in the West, and how the knowledge of Western CT is transformed when it travels to China. To achieve this aim, this thesis employs three units of analysis which respectively study MOE, a typical CT module opened by Peking University, and Renren posts.

The study of MOE aims at answering three questions:

1. Why is CT valued by the MOE?
2. What has been done by the MOE to facilitate the cultivation of CT?
3. How has CT been talked about in documents published published by the MOE in different years?

By analysing texts published by the MOE, it is found that there are three main reasons for which CT has been valued, namely promoting students' independent thinking, promoting students' innovative thinking and building world-class university. The actions have been done under the support of the MOE include offering CT modules at various Chinese universities and there are large size classes offered as not compulsory modules for all students in the universities and small size classes offered as compulsory modules for the elite students. Typically, the large size CT modules are offered by the philosophy school and taught by a teacher with logic background. The small size CT modules are very different from each other. The CT module I observed at Peking University is one of the typical.

The study of the typical CT module opened by Peking University aims at answering these research questions:

1. What was the teaching content of this CT course?
2. What teaching methods were adopted for this CT course is?
3. What was said about the relationship between CT and Chinese traditions?

It is found in the participant observation that the teaching content of the CT module contains rich knowledge regarding checking the truth of

evidence and premises and making logical inference, however, how to draw a conclusion after consulting multiple perspectives, how to be neutral when one needs to make a judgment and how to make a decision knowing there are uncertainty were not introduced. The ideas of alternative explanations, best explanation and additional evidence were hardly talked about either, though these ideas are contained in writings of important Western scholars of CT. These ideas can therefore be seen as the missing elements. Also, CT disposition and the link between reason and emotion can be seen as missing elements too. CT disposition was only mentioned passing by and emotion was talked as absolutely negative. However, among Western scholars of CT, the importance of emotion in motivation, feeling the environment, and setting a good state of mind are talked about. The teaching method of this CT module is lecture-based and few activities, such as discussion or questioning, were done during the class. Also, accusing Chinese culture for setting the tradition of learning by reciting, relying on authority and habit of language (in using quantifier words) were mentioned. The lecturer also tended to emphasise being critical to oneself, stressed that CT is neutral and was somehow reserved when talking about challenging authority.

The study of Renren posts aims at answering the following research questions:

1. What does CT mean for the students?
2. What difficulties do they identify regarding the learning of CT?
3. What topics are discussed by the students when they mention the phrase CT?

It is found by analysing the Chinese students' posts on Renren that what is missed in the CT module I observed are also missed among these students' writings. Emotion was written as totally negative by the students too. It appears that Chinese students' understanding of CT include requiring evidence, logic, being neutral, considering multiple perspectives and that CT is to doubt not always doubt. Yet how to decide when to stop doubting were not written about and there are writings indicating a

confusion regarding how to make a decision or judgment when one has to be neutral and consider multiple perspectives. This is also the only difficulty that is written by these students using Renren. In addition, the topic that is most frequently mentioned is about how to passing the exams of their CT modules, which again shows that assessment is the main concern for Chinese students.

Since the ideas regarding dealing with uncertain conclusions (additional evidence, alternative explanations and best explanation) are missed in the typical module and are related to the only difficulty written by the students, it is suggested that these ideas should be particularly emphasised when teaching CT to Chinese students.

Sometimes we need to be stable because following traditions or routines is the best solution. This can avoid too much uncertainty and in some cases people will prefer no disaster rather than surprise. On the contrary, in some cases people will prefer surprise because the risk is acceptable. I this case, being flexible will be the best solution. When the ongoing changes are not enough to change the conclusion or the alternative explanations is less possible than the old conclusion, deciding to follow the old conclusion which has been taken as tradition for long time is the way to deal with the uncertainty too. However, following routines and traditions does not mean that there will be no uncertainty. So even if the decision is to follow routines, this decision is still made under uncertainty. As a result, being conscious of uncertainty is still needed.

The knowledge regarding making decision under uncertainty is not introduced through CT education in China. However, this part of CT is very important and especially useful because in real life people often do not have enough time to doubt endlessly. Therefore, deciding what to do according to available evidence and keeping an open mind to ongoing changes may be the more practical use of CT, while checking truthfulness of the evidences and reasoning process may be only the basic use. In many cases, we can only know the evidence from others' telling and it is often not possible to check the truthfulness in person. Also, what does not

contain logical fallacies may not be the best conclusion either. As new conditions are emerging every second, a larger picture containing additional evidence and alternative possibilities may always be out there. Nevertheless, a good critical thinker needs to decide what to do or believe within certain time based on the part of the picture he or she can see. Due to these practical uses, excluding this part of CT can reduce the usefulness of CT and make students feel learning CT are less helpful.

As for the missing elements regarding emotion, I suggest that raising awareness of emotion may be more important and beneficial for the students than simply trying to ask students to block emotion out. Emotion has a cognitive aspect that can help people to understand the situation and there is a relationship between feeling and thinking which can help people to define what they want to achieve and disposition is intertwined with emotionally experience associated with certain actions (Butler and McManus, 1998). In this way, reason, emotion and disposition are linked. Therefore, finding a way to manage emotion and knowing the relationship between emotion and reason may be more realistic than trying to block emotion.

These suggestions are also written about in my articles published on core Chinese journals. In my articles 'Liberate Minds through Thinking Dialectically' (2013) and 'The Dream in My Heart' (2015) which are respectively published by core Chinese journals the *Red Flag Magazine* and the *Liberation Army Daily,* I write about the importance of CT, including the knowledge regarding being temporarily correct and being aware of the additional evidence appearing as time past on, in forming scientific thinking. In my article 'How to Regard Behavioral Finance and Mathematical Finance' (2013) and 'The Regional Economy and Interregional Economy' (2013) which are respectively published on the *GuangMing Daily* and the *Mayor's Reference,* I write about the importance of knowing the relationship between one's emotional experience, i.e. one's feeling of gaining, and one's mathematical calculation of benefits.

9.3 Limitations of the thesis

There are three main concerns about the limitation of this research.

Firstly, as this research is done by one researcher, personal bias may be unavoidable. The analysis of the textual data may be seen as a subjective interpretation. The research of the studies of the MOE and Renren were done by downloading all the texts containing the term CT so this data collection process is under control. All the texts I analysed are listed in the body of the thesis or in the appendixes and the words I used to extract information are highlighted, so they can be tracked by the readers if re-interpretation is needed. The research of the participant observation in the CT module was done by making records individually. To make amend of this shortcoming, this research was designed as having a rigorous focus on recording the topics and knowledge points that were talked about in each class. As can be seen in chapter six, the original Chinese words used in this module were presented.

As a single PhD researcher I had limited resources so it was impossible to hire another researcher to do this research at the same time with me so we can compare our recordings to confirm the objectivity of the findings. I had done this research with a sincere and serious hope to find out how CT is actually constructed in China and how improvement can be made. Even though, personal bias is an important limitation of this research as my recording and interpretation are the base of the research findings. However, I am very confident that I have recorded all the topics and knowledge points. They were said very clearly in the module so it was hard to record mistakenly. For example, when the teacher said he was going to talk about inductive inference, I would record this topic of inductive inference as a knowledge point contained in this module. It is very unlikely that I or any other researchers would record other key words when the teacher said he was going to talk about induction.

Secondly, the extent to which research findings of this thesis can be generalized to other contexts is hard to be determined. The CT module I observed is a typical one according to some basic conditions, but it is

possible that the CT modules offered by the philosophy schools of other universities would teach different content and cover different topics and knowledge points. This limitation can be amended when I found that students' writings on Renren also reflect that their understanding of CT focuses on the ideas of logic, checking evidence, but lacks the understanding about how to deal with uncertain conclusions and the relationship between disposition, emotion and reason. So the ideas contained and missed on Renren correspond with the topics contained and missed in the typical CT module I observed.

This difficulty regarding being neutral and being critical is a unique difficulty that has not been studied before. However, the research findings of this thesis can only imply that relevant topics are missing in more than one CT module, since students in more than one universities are confusing about them. How many modules did not talked about such topics or ideas are hard to confirm. After all, the number of students who write about their confusion is very small. It cannot be confirmed that this is the confusion of the most Chinese students. It can only be said that there are students in different Chinese universities who are confused because they do not know what to do after considering multiple perspectives. As a result, it relies on the readers to decide if their or their students' struggle is the same and if the suggestions I made based on the literature of Western scholars' work on CT are useful for solving their confusion.

Last but not the least, this thesis intended to study CT in China through a KT perspective which is one that has not been used before, so there are some very interesting questions that have emerged during my research. As this thesis focuses on the transform of the knowledge of CT in Chinese HE, some interesting questions are out of the scope of this thesis.

For example, many officers and educators working for the MOE generally indicated that promoting innovative thinking is the goal of cultivating CT. But the relationship between innovative/creative thinking and CT is not always same in these texts. Sometimes CT is written as if it is a prerequisite of innovative thinking while sometimes CT is equated with

innovative thinking. It would be interesting to study how they understand the link between CT and innovation exactly. How many of them see both CT and innovative thinking are important and how many of them see only the part of CT related to innovative thinking is important? If they only value the part of CT related to innovative thinking, there will be much focus on divergent thinking than convergent thinking, since sometimes creativity only means producing new ideas and does not have to concentrate these new ideas to make a decision (Hennessey and Amabile, 2009). For another example, many students on Renren are saying that they find CT or CT modules hard to understand and most of them were accusing themselves for being not smart enough with only two complaining about their modules implicitly. This can be seen as a reflection of the culture discouraging challenging authority, because the students would rather accusing themselves than asking their teachers to explain in a clearer way. What more interesting is that it occured in CT modules. These are all questions that worth deeper investigations, yet fall out of the scope due to limit of time and resource.

9.4 Suggestions for future research

The main findings of this research can be summarized as identifying some missing elements the knowledge of CT constructed in Chinese HE. Therefore, further studies could look at a new teaching program of CT and see the effect of emphasising these missing elements in teaching. The effect of a new teaching program can be evaluated by the improvement of Chinese students' CT. As reviewed in Chapter three, Chinese students are often found generally worse than Western students in making arguments, joining in debates CT and challenging others' claims, especially claims of the authority (Atkinson, 1997; Nisbett, 2004; Wan, 1998; Liu, 1998; Hu, 2002). Therefore, the effect of adding the missing ideas can be evaluated by tracking Chinese students' improvement in these aspects. For example, a longitudinal research can be conducted in the future to examine whether having CT classes that also focus on some aspects of CT that seem to be missing from current teaching will lead to an improvement of students'

CT ability, a better understanding of CT and increased motivation to engage with CT beyond passing exams.

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Appendices

Appendices of chapter 4

1.1 The link and screenshots showing conditions of the CT module offered by Peking University:

http://dean.pku.edu.cn/notice/content.php?mc=61442&id=1371784052

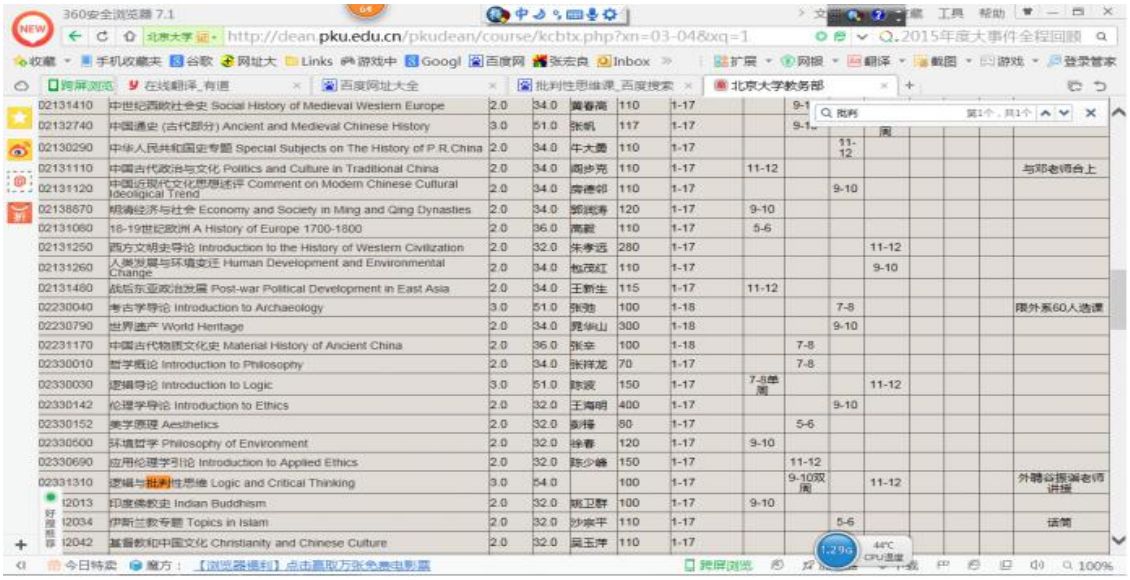




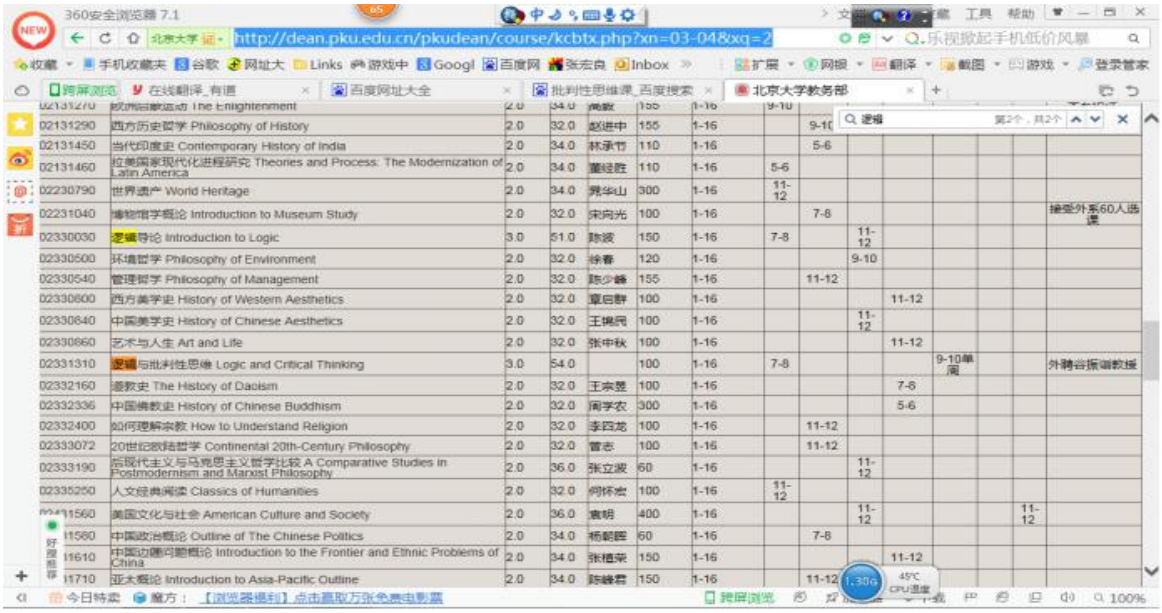
1.2 Links and screenshots showing conditions of the CT module of Peking University in different semesters:

2003-2004 semester 1 :

http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=03-04&xq=1

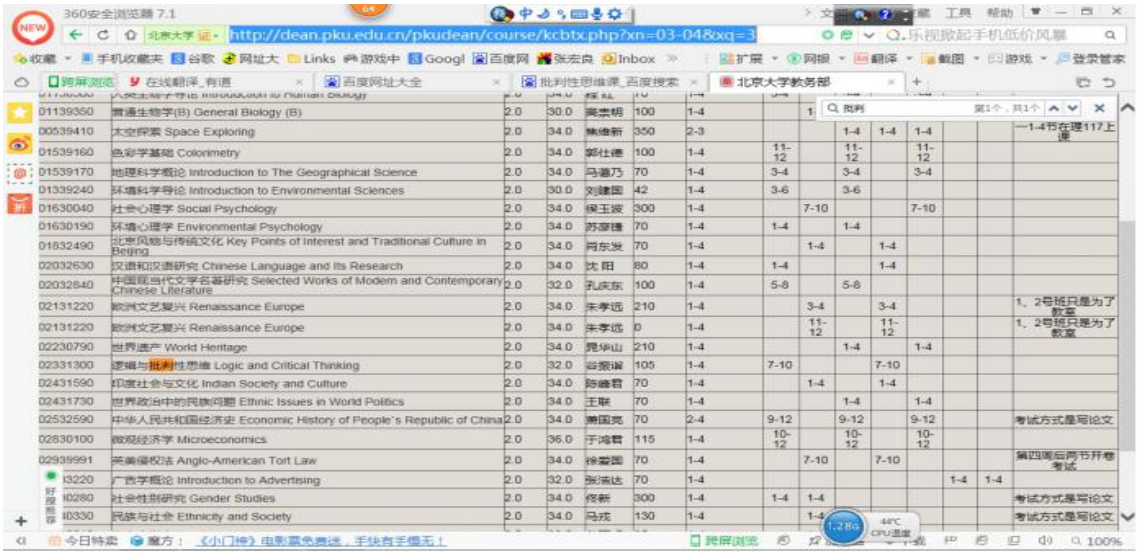


2003-2004 semester 2:http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=03-04&xq=2



2003-2004 semester 3:

http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=03-04&xq=3



2004-2005 semester 1:

http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=04-05&xq=1



2004-2005 semester 2:

http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=04-05&xq=2



2004-2005 semester 3:http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=04-05&xq=3



2005-2006 semester 1:

http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=05-06&xq=1



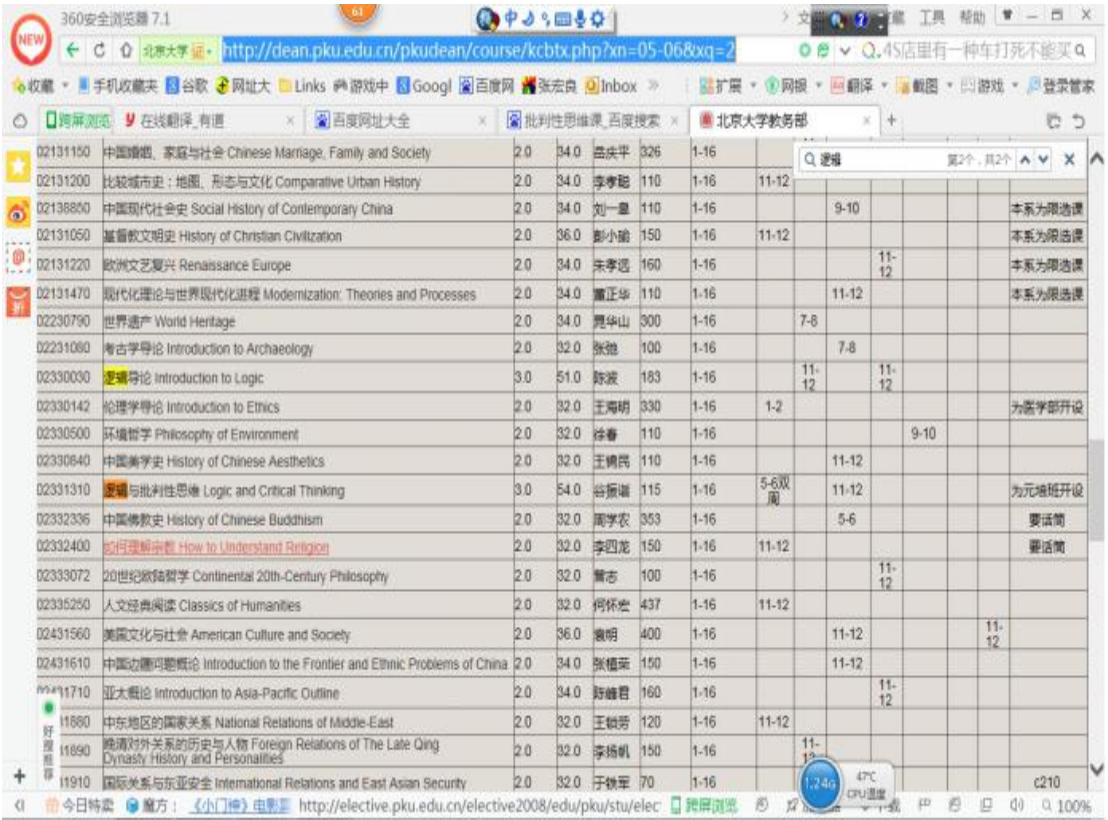
北京大学教务部
Office of Educational Administration

05-06-1本科生通选课课表 (Courses for General Education)

课程编号 Course Code	课程名 Course	学分 Credits	总学时 Hours	教师 Teacher	人数 Capacity	起止周 Lecture Weeks	星期一 MON	星期二 TUE	星期三 WED	星期四 THU	星期五 FRI	星期六 SAT	星期日 SUN	备注 Notes
00136540	数值方法：原理，算法及应用 Numerical Methods: Principles, Algorithms and Applications	3.0	51.0	胡维南	180	1-17		5-6		3-4双周				
00136700	普通统计学 Statistics	3.0	51.0	谢宗活	35	3-17			10-12					
00331480	系统与控制引论 Introduction to Systems and Control	2.0	32.0	杨莹	50	1-17		11-12						
00432266	环境生态学 Environmental Ecology	2.0	32.0	刘树华	501	1-17		5-6						
00432267	工程图学及其应用 Engineering Drawing and Its Application	2.0	30.0	王美华	70	1-17				5-6				
00432268	自然科学中的混沌和分形 Chaos and Fractal in Natural Sciences	2.0	32.0	梁福明	100	1-17					5-6			
01032770	大学化学 College Chemistry	2.0	34.0	姚光庆	100	1-17	7-8							
01033090	今日新材料 New Materials Today	2.0	32.0	李星国	60	1-17				7-8				
01034030	魅力化学 Fascinating Chemistry	2.0	32.0	寇 元	120	1-17		7-8						
01034040	化学与社会 Chemistry and Society	2.0	32.0	卞江	80	1-17			7-8					
02039310	大学语文 College Chinese	2.0	34.0	邵燕君	170	1-17			7-8					
01130320	普通生物学实验（B） General Biology Lab.(B)	1.0	34.0	殷 莹	80	2-17						1-4		
01130340	生物伦理学 Bioethics	2.0	34.0	高崇明	150	1-17				9-10				
10780	生物进化论 Biological Evolution	2.0	34.0	颜红雅	200	1-17			9-10					
10800	生态学概论 Introduction to Ecology	2.0	34.0	闵凤鸣	150	1-17			11-12					
10960	保护生物学 Conservation Biology	2.0	34.0	吕植	200	1-17								

2005-2006 semester 2:

http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=05-06&xq=2



02131150	中国婚姻、家庭与社会 Chinese Marriage, Family and Society	2.0	34.0	岳庆平	326	1-16								
02131200	比较城市史：地图、形态与文化 Comparative Urban History	2.0	34.0	李孝聪	110	1-16	11-12							
02138850	中国现代社会史 Social History of Contemporary China	2.0	34.0	刘一皇	110	1-16			9-10					本系为限选课
02131050	基督教文明史 History of Christian Civilization	2.0	36.0	彭小瑜	150	1-16	11-12							本系为限选课
02131220	欧洲文艺复兴 Renaissance Europe	2.0	34.0	朱孝远	160	1-16				11-12				本系为限选课
02131470	现代化理论与世界现代化进程 Modernization: Theories and Processes	2.0	34.0	董正华	110	1-16			11-12					本系为限选课
02230790	世界遗产 World Heritage	2.0	34.0	晁华山	300	1-16		7-8						
02231060	考古学导论 Introduction to Archaeology	2.0	32.0	张弛	100	1-16			7-8					
02330030	逻辑导论 Introduction to Logic	3.0	51.0	陈波	183	1-16		11-12		11-12				
02330142	伦理学导论 Introduction to Ethics	2.0	32.0	王海明	330	1-16	1-2							为医学部开设
02330500	环境哲学 Philosophy of Environment	2.0	32.0	徐春	110	1-16					9-10			
02330840	中国美学史 History of Chinese Aesthetics	2.0	32.0	王确昌	110	1-16			11-12					
02331310	逻辑与批判性思维 Logic and Critical Thinking	3.0	54.0	谷振诣	115	1-16	5-6双周		11-12					为元培班开设
02332336	中国佛教史 History of Chinese Buddhism	2.0	32.0	周学农	353	1-16			5-6					要适简
02332400	如何理解宗教 How to Understand Religion	2.0	32.0	李四龙	150	1-16	11-12							要适简
02333072	20世纪欧陆哲学 Continental 20th-Century Philosophy	2.0	32.0	曹志	100	1-16				11-12				
02335250	人文经典阅读 Classics of Humanities	2.0	32.0	何怀宏	437	1-16	11-12							
02431560	美国文化与社会 American Culture and Society	2.0	36.0	袁明	400	1-16			11-12			11-12		
02431610	中国边疆问题概论 Introduction to the Frontier and Ethnic Problems of China	2.0	34.0	张植荣	150	1-16			11-12					
01710	亚太概论 Introduction to Asia-Pacific Outline	2.0	34.0	陈峰君	160	1-16				11-12				
11660	中东地区的国家关系 National Relations of Middle-East	2.0	32.0	王锁劳	120	1-16	11-12							
11890	晚清对外关系的历史与人物 Foreign Relations of The Late Qing Dynasty History and Personalities	2.0	32.0	李扬帆	150	1-16		11-12						
11910	国际关系与东亚安全 International Relations and East Asian Security	2.0	32.0	于铁军	70	1-16								c210

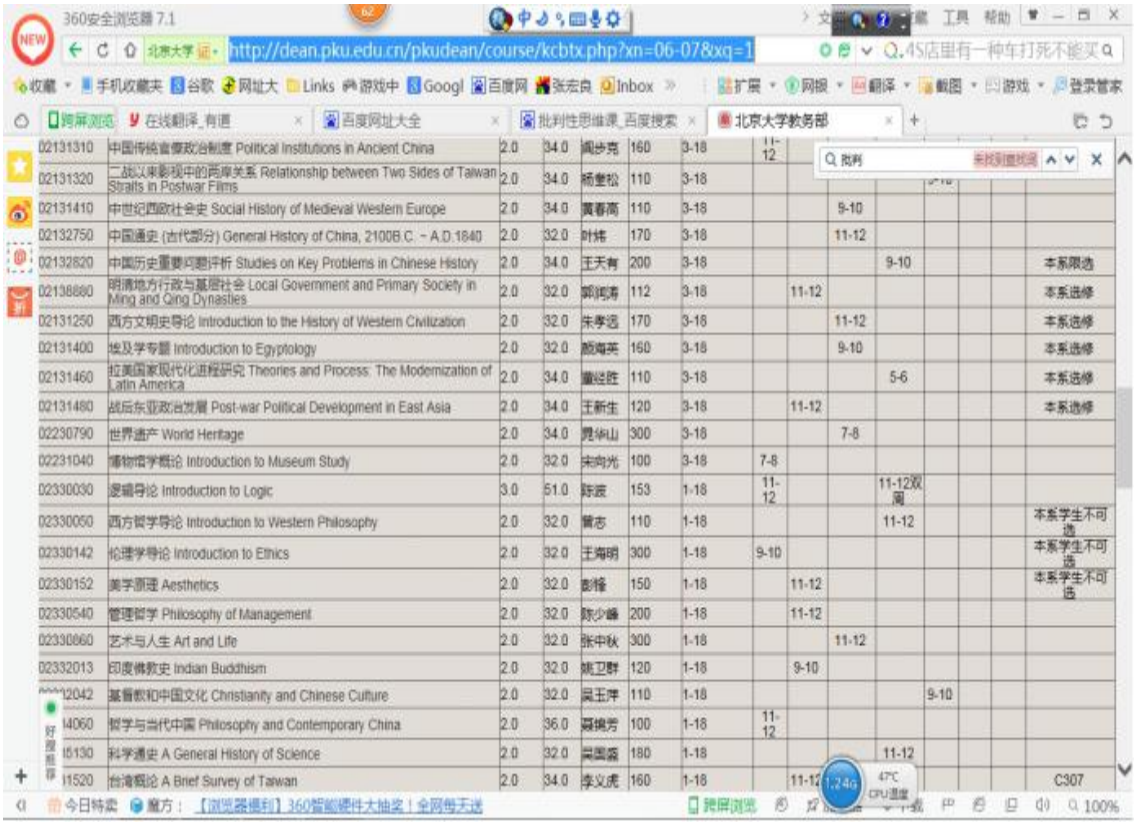
2005-2006 semester 3:

http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=05-06&xq=3



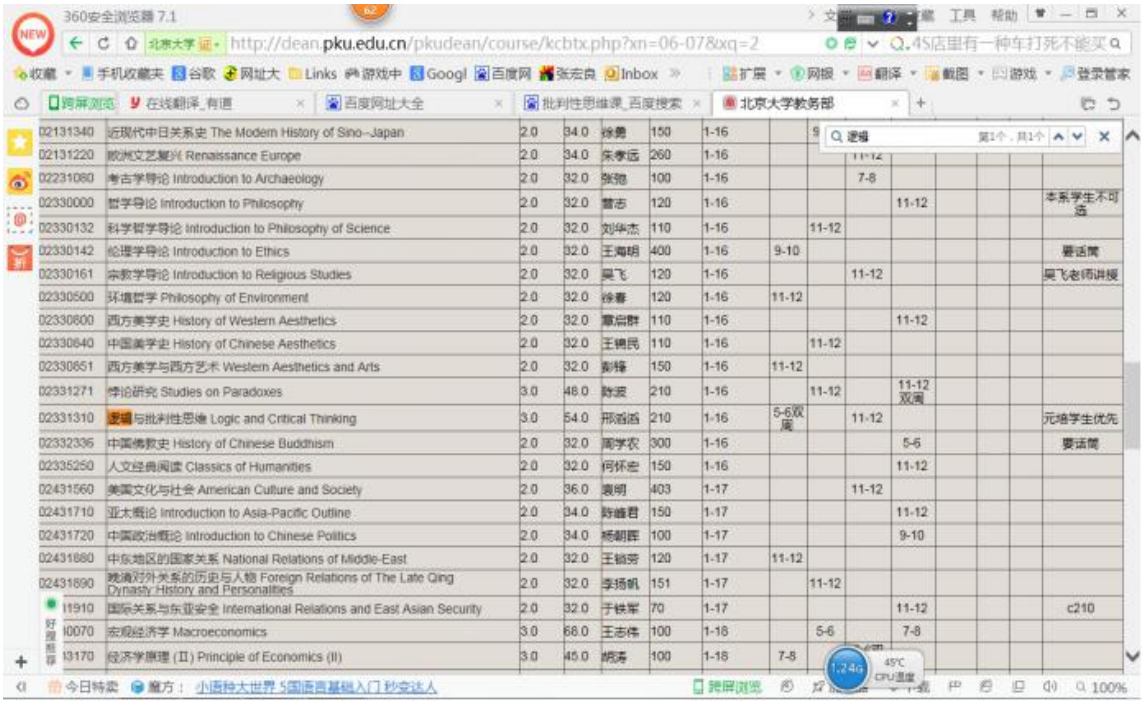
2006-2007 semester 1:

http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=06-07&xq=1



2006-2007 semester 2:

http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=06-07&xq=2



02131340	近现代中日关系史 The Modern History of Sino-Japan	2.0	34.0	徐勇	150	1-16					11-12			
02131220	欧洲文艺复兴 Renaissance Europe	2.0	34.0	朱孝远	260	1-16								
02231080	考古学导论 Introduction to Archaeology	2.0	32.0	张弛	100	1-16				7-8				
02330000	哲学导论 Introduction to Philosophy	2.0	32.0	曾志	120	1-16					11-12			本系学生不可选
02330132	科学哲学导论 Introduction to Philosophy of Science	2.0	32.0	刘华杰	110	1-16		11-12						
02330142	伦理学导论 Introduction to Ethics	2.0	32.0	王海明	400	1-16	9-10							要话筒
02330161	宗教学导论 Introduction to Religious Studies	2.0	32.0	吴飞	120	1-16				11-12				吴飞老师讲授
02330500	环境哲学 Philosophy of Environment	2.0	32.0	徐春	120	1-16	11-12							
02330800	西方美学史 History of Western Aesthetics	2.0	32.0	章启群	110	1-16					11-12			
02330640	中国美学史 History of Chinese Aesthetics	2.0	32.0	王确民	110	1-16		11-12						
02330651	西方美学与西方艺术 Western Aesthetics and Arts	2.0	32.0	彭锋	150	1-16	11-12							
02331271	悖论研究 Studies on Paradoxes	3.0	48.0	陈波	210	1-16		11-12			11-12 双周			
02331310	逻辑与批判性思维 Logic and Critical Thinking	3.0	54.0	邢滔滔	210	1-16	5-6双周			11-12				无培学生优先
02332336	中国佛教史 History of Chinese Buddhism	2.0	32.0	周学农	300	1-16					5-6			要话筒
02335250	人文经典阅读 Classics of Humanities	2.0	32.0	何怀宏	150	1-16					11-12			
02431560	美国文化与社会 American Culture and Society	2.0	36.0	袁明	403	1-17				11-12				
02431710	亚太概论 Introduction to Asia-Pacific Outline	2.0	34.0	陈峰君	150	1-17					11-12			
02431720	中国政治概论 Introduction to Chinese Politics	2.0	34.0	杨朝辉	100	1-17					9-10			
02431680	中东地区的国家关系 National Relations of Middle-East	2.0	32.0	王铁劳	120	1-17	11-12							
02431690	晚清对外关系的历史与人物 Foreign Relations of The Late Qing Dynasty History and Personalities	2.0	32.0	李扬帆	151	1-17		11-12						
11910	国际关系与东亚安全 International Relations and East Asian Security	2.0	32.0	于铁军	70	1-17					11-12			c210
10070	宏观经济学 Macroeconomics	3.0	68.0	王志伟	100	1-18		5-6			7-8			
13170	经济学原理 (II) Principle of Economics (II)	3.0	45.0	胡涛	100	1-18	7-8							

2006-2007 semester 3:

http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=06-07&xq=3



06-07-3本科生通选课课表 (Courses for General Education)

课程编号 Course Code	课程名 Course	学分 Credits	总学时 Hours	教师 Teacher	人数 Capacity	起止周 Lecture Weeks	星期一 MON	星期二 TUE	星期三 WED	星期四 THU	星期五 FRI	星期六 SAT	星期日 SUN	备注 Notes
00432266	环境生态学 Environmental Ecology	2.0	32.0	刘树华	140	1-4	3-4	3-4	3-4	3-4				8月1日交论文
01130671	人类的性、生育与健康 Human Sex, Reproduction and Health	2.0	34.0	程 红	300	1-4	1-4		1-4	1-4				8月6日上午9：00考试
01139100	脑科学导论 Introduction to Brain Sciences	2.0	34.0	孙久荣	210	1-4	7-10	7-10	7-10					8月6日下午2点考试
01635000	大学生心理卫生与咨询 Mental Health and Psychocounseling for College Students	2.0	34.0	姚萍	140	1-4	5-8		5-8					考试写论文
02033070	古代文学名著选讲 Selected Study on Famous Works of Classical Chinese Literature	2.0	32.0	杜晓勤	84	1-4		1-4			1-4			
02130241	中国近代政治制度史 Political Institutions in Modern China	2.0	36.0	茅海建	105	1-4	1-4		1-4					8月6日上午闭卷考试
02131150	中国婚姻、家庭与社会 Chinese Marriage, Family and Society	2.0	34.0	邵庆平	154	2-3	9-11	9-11	9-11	9-11	9-11	9-11	9-11	26日11-12节，论文
02131450	当代印度史 Contemporary History of India	2.0	34.0	林承节	56	1-4	7-8	7-8	7-8单周	7-8	7-8			周五，开卷
02240320	考古学导论 Introduction to Archaeology	1.0	15.0	张弛	70	1-4		3-4		3-4				
02330034	逻辑导论 Introduction to Logic	2.0	30.0	陈波	126	1-4		7-10		7-10				第四周随堂闭卷考试
02330050	西方哲学导论 Introduction to Western Philosophy	2.0	32.0	曾志	119	1-4	7-10		7-10					考试写论文
02330142	伦理学导论 Introduction to Ethics	2.0	32.0	王海明	126	1-4	1-4		1-4					最后一次课开卷考试
02331300	逻辑与批判性思维 Logic and Critical Thinking	2.0	32.0	翁振谊	105	1-4	1-4		1-4					随堂闭卷考试
02333072	20世纪欧陆哲学 Continental 20th-Century Philosophy	2.0	32.0	曾志	119	1-4		7-10			7-10			考试写论文
02431590	印度社会与文化 Indian Society and Culture	2.0	34.0	陈峰君	70	1-4		1-4			1-4			考试写论文
11710	亚太概论 Introduction to Asia-Pacific Outline	2.0	34.0	陈峰君	70	1-4	1-4			1-4				考试写论文
12360	中国文化史 History of Chinese Culture	2.0	32.0	王确贵	84	1-2	1-4	1-4	1-4	1-4				
13243	中国名著导读 Masterpieces of Chinese Literature	2.0	34.0	王余光	84	1-2	1-4	1-4	1-4	1-4				
10280	社会性别研究 Gender Studies	2.0	34.0	佟新	112	1-5	5-8							考试写论文

2007-2008 semester 1:

http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=07-08&xq=1



北京大学教务部
Office of Educational Administration

07-08-1本科生通选课课表 (Courses for General Education)

课程编号 Course Code	课程名 Course	学分 Credits	总学时 Hours	教师 Teacher	人数 Capacity	起止周 Lecture Weeks	星期一 MON	星期二 TUE	星期三 WED	星期四 THU	星期五 FRI	星期六 SAT	星期日 SUN	备注Notes
00136540	数值方法：原理，算法及应用 Numerical Methods: Principles, Algorithms and Applications	3.0	51.0	汤华中	90	1-18			7-9					数学1114
00136800	数学的思维方式与创新 The Mode of Mathematical Thinking and Bring Forth New Idea	3.0	54.0	丘维声	160	1-16			1-2		3-4双周			
00432266	环境生态学 Environmental Ecology	2.0	32.0	刘树华	500	1-17	5-6							
00432268	自然科学中的混沌和分形 Chaos and Fractal in Natural Sciences	2.0	32.0	梁福明	100	1-17				5-6				
00432270	大气概论 Introduction to Atmosphere	2.0	30.0	李万彪	100	1-16	11-12							
01033090	今日新材料 New Materials Today	2.0	32.0	李星国	80	1-16				7-8				
01034030	魅力化学 Fascinating Chemistry	2.0	32.0	寇 元	200	1-16	7-8							
01034040	化学与社会 Chemistry and Society	2.0	32.0	卞江	100	1-16			7-8					
01034060	大学化学 College Chemistry	2.0	30.0	卞祖强	70	1-16		7-8						
01130320	普通生物学实验（B） General Biology Lab.(B)	1.0	34.0	殷 莹	80	2-16						1-3		地点：老生物楼103
01130320	普通生物学实验（B） General Biology Lab.(B)	1.0	34.0	殷 莹	80	2-16						6-8		地点：老生物楼103
01130780	生物进化论 Biological Evolution	2.0	34.0	颜红葵	120	1-16		9-10						
[illegible]0871	人类的性、生育与健康 Human Sex, Reproduction and Health	2.0	34.0	程 红	403	1-16	9-10							
[illegible]0960	保护生物学 Conservation Biology	2.0	34.0	吕植	200	1-16	11-12							
[illegible]9350	普通生物学(B) General Biology (B)	2.0	30.0	丁明孝	170	1-16		9-10						
[illegible]9310	大学语文 College Chinese	2.0	34.0	叶舒赛	165	1-16								

2007-2008 semester 2:

http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=07-08&xq=2



02131270	欧洲启蒙运动 The Enlightenment	2.0	34.0	黄毅	150	1-16								
02231080	考古学导论 Introduction to Archaeology	2.0	32.0	张弛	100	1-16				7-8				考古必修
02330000	哲学导论 Introduction to Philosophy	2.0	32.0	赵敦华	180	1-16	11-12							
02330142	伦理学导论 Introduction to Ethics	2.0	32.0	王海明	150	1-16	9-10							本系学生不可选
02330161	宗教学导论 Introduction to Religious Studies	2.0	32.0	李四龙	120	1-16			11-12					本系学生不可选
02330500	环境哲学 Philosophy of Environment	2.0	32.0	徐春	100	1-16			11-12					
02330640	中国美学史 History of Chinese Aesthetics	2.0	32.0	王德民	110	1-16	11-12							
02330651	西方美学与西方艺术 Western Aesthetics and Arts	2.0	32.0	彭锋	150	1-16				11-12				
02331310	逻辑与批判性思维 Logic and Critical Thinking	3.0	54.0	邢滔滔	210	1-16	5-6双周			11-12				
02332336	中国佛教史 History of Chinese Buddhism	2.0	32.0	圣学农	301	1-16	5-6							话筒
02335260	文学与伦理 Literature and Ethics	2.0	32.0	何怀宏	120	1-16			11-12					
02431560	美国文化与社会 American Culture and Society	2.0	36.0	袁明	401	1-17			11-12					
02431580	中国政治概论 Outline of The Chinese Politics	2.0	34.0	杨朝辉	100	1-17				9-10				原3/203第3周还用一次
02431610	中国边疆问题概论 Introduction to the Frontier and Ethnic Problems of China	2.0	34.0	张植荣	100	1-17			11-12					307
02431710	亚太概论 Introduction to Asia-Pacific Outline	2.0	34.0	陈峰君	160	1-17				11-12				307
02431890	晚清对外关系的历史与人物 Foreign Relations of The Late Qing Dynasty History and Personalities	2.0	32.0	李扬帆	120	1-17		11-12						307
02431910	国际关系与东亚安全 International Relations and East Asian Security	2.0	32.0	于铁军	70	1-17	11-12							210
02433200	伊斯兰与世界政治 Islam in World Politics	2.0	30.0	王联	120	1-17	11-12							307
[illegible]0070	宏观经济学 Macroeconomics	3.0	68.0	王志伟	100	1-18		11-12		11-12				
[illegible]0160	外国经济史 History of Foreign Economies	2.0	34.0	周建波	100	1-18			11-12					
[illegible]3170	经济学原理 (II) Principle of Economics (II)	3.0	45.0	郭研	100	1-18				7-9				
[illegible]3340	中国经济思想史 History of Chinese Economic Thoughts	3.0	45.0	郑学益	100	1-18								

2007-2008 semester 3:

http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=07-08&xq=3



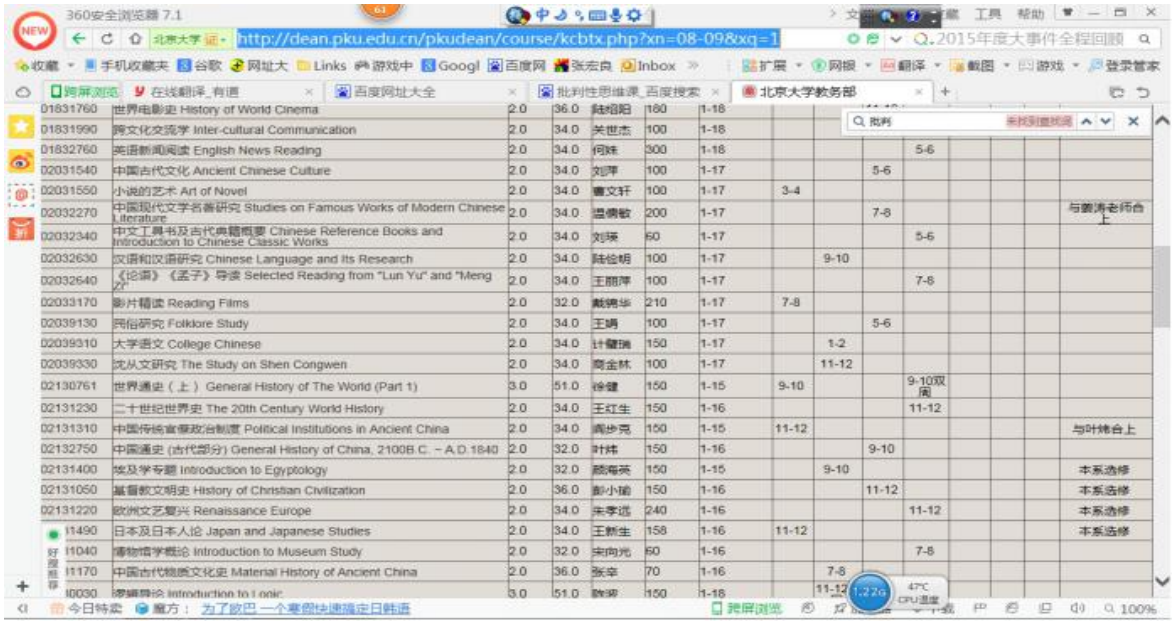
北京大学教务部
Office of Educational Administration

07-08-3本科生通选课课表 (Courses for General Education)

课程编号 Course Code	课程名 Course	学分 Credits	总学时 Hours	教师 Teacher	人数 Capacity	起止周 Lecture Weeks	星期一 MON	星期二 TUE	星期三 WED	星期四 THU	星期五 FRI	星期六 SAT	星期日 SUN	备注Notes
01233170	地震概论 Introduction to Seismology	2.0	32.0	赵克常	200	1-4	3-4	3-4	3-4	3-4				新开取代环境生态学
02032630	汉语和汉语研究 Chinese Language and Its Research	2.0	34.0	沈 阳	120	1-4	5-8		5-8		5-8			1-3周上课第4周1考试
02131450	当代印度史 Contemporary History of India	2.0	34.0	林承节	100	1-4	7-8	7-8	7-8双周	7-8	7-8			第四周周五开卷考试
02240320	考古学导论 Introduction to Archaeology	1.0	15.0	张弛	60	1-4		7-8		7-8				
02330050	西方哲学导论 Introduction to Western Philosophy	2.0	32.0	曾志	181	1-4	9-12		9-12					
02330142	伦理学导论 Introduction to Ethics	2.0	32.0	王海明	180	1-4	1-4	1-4						最后一次课开卷考试
02331300	逻辑与批判性思维 Logic and Critical Thinking	2.0	32.0	谷振诣	180	1-4		1-4		1-4				最后一次课3-4节考试
03032360	中国文化史 History of Chinese Culture	2.0	32.0	王晚贵	100	1-2	1-4	1-4	1-4	1-4				
03530010	东方文学史 History of Oriental Literature	2.0	32.0	魏丽明	100	1-4		1-4		1-4				
03532260	中日文化交流史 History of Cultural Exchange between China and Japan	2.0	32.0	那军	200	3-4	7-10	7-10		7-10	7-10			
04330881	基本乐理与管弦乐基础 Basic Theory of Music and The Basics of Orchestral Music	2.0	32.0	马 清	180	1-4	1-4		1-4					随堂开卷考试
04331020	中外名曲赏析 Appreciation of Chinese and Foreign Famous Songs	2.0	32.0	李静	120	1-4			1-4		1-4			随堂闭卷考试
[illegible]9240	环境科学导论 Introduction to Environmental Sciences	2.0	30.0	刘建国	80	1-4				5-8	5-8			

2008-2009 semester 1:

http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=08-09&xq=1



01831760	世界电影史 History of World Cinema	2.0	36.0	陆绍阳	180	1-18								
01831990	跨文化交流学 Inter-cultural Communication	2.0	34.0	关世杰	100	1-18								
01832760	英语新闻阅读 English News Reading	2.0	34.0	何妹	300	1-18					5-6			
02031540	中国古代文化 Ancient Chinese Culture	2.0	34.0	刘萍	100	1-17			5-6					
02031550	小说的艺术 Art of Novel	2.0	34.0	曹文轩	100	1-17	3-4							
02032270	中国现代文学名著研究 Studies on Famous Works of Modern Chinese Literature	2.0	34.0	温儒敏	200	1-17			7-8					与袁清老师合上
02032340	中文工具书及古代典籍概要 Chinese Reference Books and Introduction to Chinese Classic Works	2.0	34.0	刘琢	60	1-17					5-6			
02032630	汉语和汉语研究 Chinese Language and Its Research	2.0	34.0	陆俭明	100	1-17		9-10						
02032640	《论语》《孟子》导读 Selected Reading from "Lun Yu" and "Meng Zi"	2.0	34.0	王丽萍	100	1-17					7-8			
02033170	影片精读 Reading Films	2.0	32.0	戴锦华	210	1-17	7-8							
02039130	民俗研究 Folklore Study	2.0	34.0	王娟	100	1-17			5-6					
02039310	大学语文 College Chinese	2.0	34.0	计建强	150	1-17		1-2						
02039330	沈从文研究 The Study on Shen Congwen	2.0	34.0	金林	100	1-17		11-12						
02130761	世界通史（上） General History of The World (Part 1)	3.0	51.0	徐健	150	1-15	9-10				9-10双周			
02131230	二十世纪世界史 The 20th Century World History	2.0	34.0	王红生	150	1-16					11-12			
02131310	中国传统官僚政治制度 Political Institutions in Ancient China	2.0	34.0	阎步克	150	1-15	11-12							与叶炜合上
02132750	中国通史 (古代部分) General History of China, 2100B.C. – A.D.1840	2.0	32.0	叶炜	150	1-16			9-10					
02131400	埃及学专题 Introduction to Egyptology	2.0	32.0	颜海英	150	1-15		9-10						本系选修
02131060	基督教文明史 History of Christian Civilization	2.0	36.0	彭小瑜	150	1-16			11-12					本系选修
02131220	欧洲文艺复兴 Renaissance Europe	2.0	34.0	朱孝远	240	1-16					11-12			本系选修
[illegible]1490	日本及日本人论 Japan and Japanese Studies	2.0	34.0	王新生	158	1-16	11-12							本系选修
[illegible]1040	博物馆学概论 Introduction to Museum Study	2.0	32.0	宋向光	60	1-16					7-8			
[illegible]1170	中国古代物质文化史 Material History of Ancient China	2.0	36.0	张辛	70	1-16			7-8					
[illegible]0030	逻辑导论 Introduction to Logic	3.0	51.0	鞠实	150	1-18			11-12					

2008-2009 semester 2:

http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=08-09&xq=2



02231080	考古学导论 Introduction to Archaeology	2.0	32.0	张弛	100	1-16			12					
02330000	哲学导论 Introduction to Philosophy	2.0	32.0	吴增定	150	1-16								本系学生不可选
02330030	逻辑导论 Introduction to Logic	3.0	51.0	陈波	170	1-16		11-12		11-12双周				
02330142	伦理学导论 Introduction to Ethics	2.0	32.0	王海明	400	1-16	9-10							本系学生不可选
02330161	宗教学导论 Introduction to Religious Studies	2.0	32.0	王 颂	100	1-16			11-12					本系学生不可选
02330500	环境哲学 Philosophy of Environment	2.0	32.0	徐春	115	1-16				11-12				
02330851	西方美学与西方艺术 Western Aesthetics and Arts	2.0	32.0	奚彤	155	1-16				11-12				
02330860	艺术与人生 Art and Life	2.0	32.0	张中秋	180	1-16			11-12					
02331310	逻辑与批判性思维 Logic and Critical Thinking	3.0	54.0	刘壮虎	162	1-16	11-12双周		5-6					
02332336	中国佛教史 History of Chinese Buddhism	2.0	32.0	周学农	300	1-16	5-6							
02333630	文化哲学与文化产业 Cultural Philosophy and Cultural Industries	2.0	32.0	陈少峰	200	1-16			11-12					
02335130	科学通史 A General History of Science	2.0	32.0	吴国盛	210	1-16				11-12				
02431560	美国文化与社会 American Culture and Society	2.0	36.0	袁明	380	1-17			11-12					
02431580	中国政治概论 Outline of The Chinese Politics	2.0	34.0	杨朝晖	100	1-17				9-10				
02431590	印度社会与文化 Indian Society and Culture	2.0	34.0	辛维君	300	1-17		11-12						
02431610	中国边疆问题概论 Introduction to the Frontier and Ethnic Problems of China	2.0	34.0	张植荣	100	1-17		11-12					C307	
02431860	中东地区的国家关系 National Relations of Middle-East	2.0	32.0	王铁劳	120	1-17	11-12						C307	
02431890	晚清对外关系的历史与人物 Foreign Relations of The Late Qing Dynasty History and Personalities	2.0	32.0	李扬帆	100	1-17			11-12				c307	
02431910	国际关系与东亚安全 International Relations and East Asian Security	2.0	32.0	于铁军	70	1-17	11-12						C210	
03200	伊斯兰与世界政治 Islam in World Politics	2.0	30.0	王联	120	1-17			5-6				c307	
00070	宏观经济学 Macroeconomics	3.0	68.0	王志伟	100	1-18		11-12		1-2				
00160	外国经济史 History of Foreign Economies	2.0	34.0	周建波	120	1-18								

2008-2009 semester 3:

http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=08-09&xq=3



北京大学教务部 Office of Educational Administration

部门介绍 本科招生 教学与培养 学籍管理 教务管理 教学评估 交流合作 暑期学校

08-09-3本科生通选课课表 (Courses for General Education)

课程编号 Course Code	课程名 Course	学分 Credits	总学时 Hours	教师 Teacher	人数 Capacity	起止周 Lecture Weeks	星期一 MON	星期二 TUE	星期三 WED	星期四 THU	星期五 FRI	星期六 SAT	星期日 SUN	备注Notes
01233170	地震概论 Introduction to Seismology	2.0	32.0	赵克常	450	1-4	7-8	7-8	7-8	7-8				
01635060	大学生心理健康 Mental Health for College Students	2.0	32.0	姚萍	155	1-4		1-4		1-4				期末交报告
02033630	中国古代文化 Ancient Chinese Culture	2.0	32.0	刘萍	75	1-4		1-4			1-4			
02131450	当代印度史 Contemporary History of India	2.0	34.0	林承节	75	1-5	7-8	7-8	7-8单周	7-8	7-8			第五周周一开卷考试
02240320	考古学导论 Introduction to Archaeology	1.0	15.0	张弛	70	1-4		3-4		3-4				
02330050	西方哲学导论 Introduction to Western Philosophy	2.0	32.0	曾志	150	1-4	9-12		9-12					
02330142	伦理学导论 Introduction to Ethics	2.0	32.0	王海明	150	1-2	1-4	1-4	1-4	1-4				
02939991	英美侵权法 Anglo-American Tort Law	2.0	34.0		22	1-5			5-8		5-8			杨自然老师中英文授课
03032360	中国文化史 History of Chinese Culture	2.0	32.0	王晓贵	95	1-2	1-4	1-4	1-4	1-4				
03130400	教育社会学思考 The Thinking of Sociology of Education	2.0	36.0	钱民辉	130	1-4		5-8			5-8			
03532260	中日文化交流史 History of Cultural Exchange between China and Japan	2.0	32.0	卿军	280	1-2	9-12	9-12		9-12	9-12			
04330881	基本乐理与管弦乐基础 Basic Theory of Music and The Basics of Orchestral Music	2.0	32.0	马 清	200	1-5	1-4		1-4					

2009-2010 semester 1:

http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=09-10&xq=1



01639020	心理学概论 Introduction to Psychology	2.0	32.0	张智勇	300	1-16		11-12					
01831610	汉语修辞学 Rhetoric in Chinese	2.0	34.0	陈汝东	120	1-16		5-6					
01831760	世界电影史 History of World Cinema	2.0	36.0	陆绍阳	180	1-16				11-12			
01831990	跨文化交流学 Inter-cultural Communication	2.0	34.0	关世杰	70	1-16				11-12			
01832760	英语新闻阅读 English News Reading	2.0	34.0	何姝	105	1-16		5-6					需要能够上网的教室
02030330	民俗学 Folklore	2.0	34.0	陈泳超	165	1-16		11-12					
02031550	小说的艺术 Art of Novel	2.0	34.0	曹文轩	110	1-16		3-4					
02032340	中文工具书及古代典籍概要 Chinese Reference Books and Introduction to Chinese Classic Works	2.0	34.0	刘琪	50	1-16		5-6					
02032630	汉语和汉语研究 Chinese Language and Its Research	2.0	34.0	陆俭明	100	1-16				9-10			
02033010	老舍与现代中国文化 Lao She and Modern China Culture	2.0	36.0	孔庆东	300	1-16			9-10				
02039310	大学语文 College Chinese	2.0	34.0	王风	150	1-16				5-6			本系同学不可选
02131230	二十世纪世界史 The 20th Century World History	2.0	34.0	王红生	150	1-16					11-12		
02131310	中国传统官僚政治制度 Political Institutions in Ancient China	2.0	34.0	阎步克	150	1-16				11-12			与叶炜合上
02132750	中国通史 (古代部分) General History of China, 2100B.C. ~ A.D.1840	2.0	32.0	晁宏海	160	1-16			11-12				
02131050	基督教文明史 History of Christian Civilization	2.0	36.0	彭小瑜	150	1-16					11-12		本系限选
02131060	18-19世纪欧洲 A History of Europe 1700-1800	2.0	36.0	高毅	150	1-16			9-10				本系限选
02131220	欧洲文艺复兴 Renaissance Europe	2.0	34.0	朱孝远	240	1-16			11-12				本系限选
02131400	埃及学专题 Introduction to Egyptology	2.0	32.0	颜海英	150	1-16					9-10		本系选修
02131430	美国史通论 General Survey of American History	2.0	34.0	王希	150	1-16		9-10					本系选修
11440	西方文化通论 An Outline of Western Civilizations	2.0	34.0	钱乘旦	150	1-16				9-10			本系选修
11810	伊斯兰教与现代世界 Islam and Modern World	2.0	32.0	普涛	150	1-16					5-6		本系选修
11170	中国古代物质文化史 Material History of Ancient China	2.0	36.0	张辛	100	1-16			7-8				
10030	逻辑导论 Introduction to Logic	3.0	51.0	陈波	205	1-16			11				

2009-2010 semester 2:

http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=09-10&xq=2



02131250	西方文明史导论 Introduction to the History of Western Civilization	2.0	32.0	朱孝远	250	1-16		11-1					
02131260	人类发展与环境变迁 Human Development and Environmental Change	2.0	34.0	包茂红	150	1-16							
02131460	拉美国家现代化进程研究 Theories and Process: The Modernization of Latin America	2.0	34.0	董经胜	150	1-16				5-6			本系选修
02131810	伊斯兰教与现代世界 Islam and Modern World	2.0	32.0	普涛	150	1-16	5-6						本系选修
02139060	罗马史 History of Rome	2.0	34.0	彭小瑜	150	1-16			11-12				本系选修
02330000	哲学导论 Introduction to Philosophy	2.0	32.0	吴增定	200	1-16			11-12				本系学生不可选
02330030	逻辑导论 Introduction to Logic	3.0	51.0	陈波	200	1-16		11-12单周		11-12			
02330142	伦理学导论 Introduction to Ethics	2.0	32.0	王海明	300	1-16	9-10						本系学生不可选
02330152	美学原理 Aesthetics	2.0	32.0	彭锋	150	1-16	11-12						本系学生不可选
02330161	宗教学导论 Introduction to Religious Studies	2.0	32.0	李四龙	150	1-16	11-12						本系学生不可选
02330600	西方美学史 History of Western Aesthetics	2.0	32.0	曹俊峰	150	1-16				11-12			
02330860	艺术与人生 Art and Life	2.0	32.0	张中秋	220	1-16		11-12					
02331310	逻辑与批判性思维 Logic and Critical Thinking	3.0	54.0	刘壮虎	200	1-16	11-12			5-6单周			
02332336	中国佛教史 History of Chinese Buddhism	2.0	32.0	周学农	301	1-16	5-6						投影、主机
02333400	近代西方哲学 Modern Western Philosophy	2.0	32.0	李超杰	120	1-16	11-12						
02333830	文化哲学与文化产业 Cultural Philosophy and Cultural Industries	2.0	32.0	陈少峰	197	1-16			11-12				
02335130	科学通史 A General History of Science	2.0	32.0	吴国盛	200	1-16			11-12				
02335250	人文经典阅读 Classics of Humanities	2.0	32.0	吴飞	200	1-16		11-12					
02431560	美国文化与社会 American Culture and Society	2.0	36.0	查明	400	1-17			11-12				
02431580	中国政治概论 Outline of The Chinese Politics	2.0	34.0	杨朝晖	100	1-17				9-10			C307
11610	中国边疆问题概论 Introduction to the Frontier and Ethnic Problems of China	2.0	34.0	张植荣	100	1-17	9-10						
11880	中东地区的国家关系 National Relations of Middle-East	2.0	32.0	王铁荣	120	1-17		11-12					C307
11890	晚清对外关系的历史与人物 Foreign Relations of The Late Qing Dynasty: History and Personalities	2.0	32.0	李扬帆	100	1-17							C307

2009-2010 semester 3:

http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=09-10&xq=3



北京大学教务部
Office of Educational Administration

09-10-3本科生通选课课表 (Courses for General Education)

课程编号 Course Code	课程名 Course	学分 Credits	总学时 Hours	教师 Teacher	人数 Capacity	起止周 Lecture Weeks	星期一 MON	星期二 TUE	星期三 WED	星期四 THU	星期五 FRI	星期六 SAT	星期日 SUN	备注Notes
01233170	地震概论 Introduction to Seismology	2.0	32.0	赵克常	350	1-4	1-2	1-2	1-2	1-2				
01635060	大学生心理健康 Mental Health for College Students	2.0	32.0	姚萍	140	1-4		1-4		1-4				
02033630	中国古代文化 Ancient Chinese Culture	2.0	32.0	林嘉	105	1-4	1-4			1-4				
02033680	民俗学 Folklore	2.0	32.0	陈泳超	105	1-4	1-4	1-4						
02332311	佛教导论 An Introdution to Buddhism	2.0	32.0	姚卫群	112	1-3	1-4		1-4		1-4			
02431590	印度社会与文化 Indian Society and Culture	2.0	34.0	陈峰君	70	1-5	1-4		1-4					第五周论文考试
02431710	亚太概论 Introduction to Asia-Pacific Outline	2.0	34.0	陈峰君	70	1-5	7-10		7-10					第五周论文考试
03032360	中国文化史 History of Chinese Culture	2.0	32.0	王锦贵	106	1-2	1-4	1-4	1-4	1-4				
03130400	教育社会学思考 The Thinking of Sociology of Education	2.0	36.0	姚民辉	112	1-4		1-4		1-4				
03130940	人类学导论 Introduction to Anthropology	2.0	36.0	朱晓阳	70	1-5	1-4		7-10					
03532260	中日文化交流史 History of Cultural Exchange between China and Japan	2.0	32.0	陈军	201	1-2	9-12	9-12		9-12	9-12			7月23日11、12考试
04330881	基本乐理与管弦乐基础 Basic Theory of Music and The Basics of Orchestral Music	2.0	32.0	马清	250	1-4	1-4		1-4					

2010-2011 semester 1:

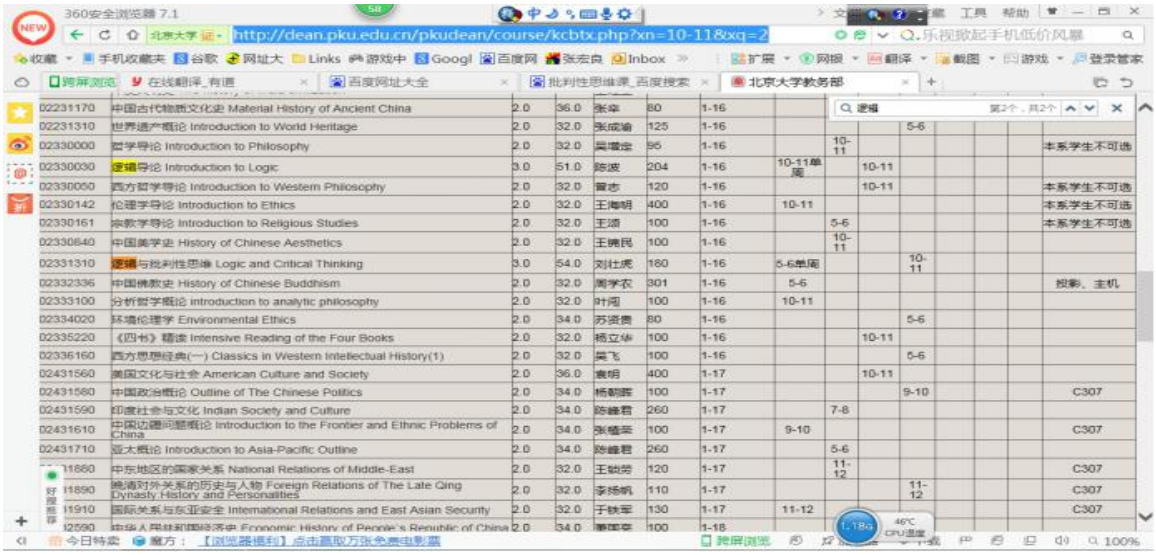
http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=10-11&xq=1



01831610	汉语修辞学 Rhetoric in Chinese	2.0	34.0	陈汝东	120	1-17								
01831760	世界电影史 History of World Cinema	2.0	36.0	陆绍阳	175	1-17			5-6					
01831990	跨文化交流学 Inter-cultural Communication	2.0	34.0	关世杰	70	1-17			10-11					
01832490	北京风格与传统文化 Key Points of Interest and Traditional Culture in Beijing	2.0	34.0	肖东发	190	1-17				5-6				
01832760	英语新闻阅读 English News Reading	2.0	34.0	何姝	115	1-17				5-6				
02030330	民俗学 Folklore	2.0	34.0	王娟	100	1-17			5-6					
02031540	中国古代文化 Ancient Chinese Culture	2.0	34.0	廖可斌	100	1-17	10-11							
02032270	中国现代文学名著研究 Studies on Famous Works of Modern Chinese Literature	2.0	34.0	商金林	160	1-17			10-11					
02032340	中文工具书及古代典籍概要 Chinese Reference Books and Introduction to Chinese Classic Works	2.0	34.0	刘琪	50	1-17				5-6				
02032640	《论语》《孟子》导读 Selected Reading from "Lun Yu" and "Meng Zi"	2.0	34.0	王丽萍	100	1-17			7-8					
02032770	金庸小说研究 Studies on Novels of Jin Yong	2.0	32.0	孔庆东	380	1-17		10-11						
02039310	大学语文 College Chinese	2.0	34.0	杨海峰	150	1-17	3-4							
02131230	二十世纪世界史 The 20th Century World History	2.0	34.0	王红生	150	1-17				10-11				
02131310	中国传统官僚政治制度 Political Institutions in Ancient China	2.0	34.0	阎步克	160	1-17			10-11					与叶炜合开
02132750	中国通史 (古代部分) General History of China, 2100B.C. ~ A.D.1840	2.0	32.0	叶炜	160	1-17		10-11						
02138870	明清经济与社会 Economy and Society in Ming and Qing Dynasties	2.0	34.0	郭润涛	150	1-17	10-11							本系选修
02131050	基督教文明史 History of Christian Civilization	2.0	36.0	彭小瑜	150	1-17			10-11					本系限选
02131220	欧洲文艺复兴 Renaissance Europe	2.0	34.0	朱孝远	300	1-17		10-11						本系选修
02131400	埃及学专题 Introduction to Egyptology	2.0	32.0	颜海英	150	1-17	10-11							本系选修
11480	战后东亚政治发展 Post-war Political Development in East Asia	2.0	34.0	王新生	150	1-17				10-11				本系选修
11170	中国古代物质文化史 Material History of Ancient China	2.0	36.0	张辛	100	1-17	7-8							
11310	世界遗产概论 Introduction to World Heritage	2.0	32.0	张成渝	95	1-17				5-6				
10030	逻辑导论 Introduction to Logic	3.0	51.0	陈波	199	1-17	10-11单							

2010-2011 semester 2:

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2010-2011 semester 3:

http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=10-11&xq=3



北京大学教务部
Office of Educational Administration

10-11-3本科生通选课课表 (Courses for General Education)

课程编号 Course Code	课程名 Course	学分 Credits	总学时 Hours	教师 Teacher	人数 Capacity	起止周 Lecture Weeks	星期一 MON	星期二 TUE	星期三 WED	星期四 THU	星期五 FRI	星期六 SAT	星期日 SUN	备注Notes
01233170	地震概论 Introduction to Seismology	2.0	32.0	赵克常	440	1-4	1-2	1-2	1-2	1-2				7月28日考试
02033530	中国古代文化 Ancient Chinese Culture	2.0	32.0	刘洋	100	1-4		1-4			1-4			
02330142	伦理学导论 Introduction to Ethics	2.0	32.0	王海明	120	1-2	1-4	1-4	1-4	1-4				
02332311	佛教导论 An Introdution to Buddhism	2.0	32.0	龚卫群	150	1-2	1-4	1-4		1-4	1-4			
03032360	中国文化史 History of Chinese Culture	2.0	32.0	王锦贵	100	1-2	1-4	1-4	1-4	1-4				
03530190	日本文化艺术专题 The Special Topic on Japanese Culture and Art	2.0	32.0	滕军	260	1-2	5-8	5-8		5-8	5-8			随堂开卷考试
04330681	基本乐理与管弦乐基础 Basic Theory of Music and The Basics of Orchestral Music	2.0	32.0	马清	120	1-4	1-4		1-4					

2011-2012 semester 1:

http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=11-12&xq=1



北京大学教务部
Office of Educational Administration

11-12-1本科生通选课课表 (Courses for General Education)

课程编号 Course Code	课程名 Course	学分 Credits	总学时 Hours	教师 Teacher	人数 Capacity	起止周 Lecture Weeks	星期一 MON	星期二 TUE	星期三 WED	星期四 THU	星期五 FRI	星期六 SAT	星期日 SUN	备注Notes
00136540	数值方法：原理，算法及应用 Numerical Methods: Principles, Algorithms and Applications	3.0	51.0	汤华中	90	1-16		7-9						
00136700	普通统计学 Statistics	3.0	51.0	耿直	180	1-16	7-8		7-8单周					
00136800	数学的思维方式与创新 The Mode of Mathematical Thinking and Bring Forth New Idea	3.0	54.0	丘维声	180	1-16				1-2	3-4双周			
00432270	大气概论 Introduction to Atmosphere	2.0	30.0	李万彪	100	1-17		10-11						
00434091	纳米科学前沿 Frontier of Nano--Science and Technology	2.0	32.0	俞大鹏	100	1-17			5-6					
01033090	今日新材料 New Materials Today	2.0	32.0	李星国	105	2-16				7-8				
01033100	功能化学 Chemical Function of Materials	2.0	32.0	邹德春	50	1-16		7-8						
01034030	魅力化学 Fascinating Chemistry	2.0	32.0	黄建滨	200	1-16	7-8							
01034040	化学与社会 Chemistry and Society	2.0	32.0	卞江	80	1-16		7-8						
01035090	大学化学 College Chemistry	3.0	48.0	卞祖强	80	1-16	7-8		7-8双周					
01130320	普通生物学实验（B） General Biology Lab (B)	1.0	34.0	侯巧明	40	2-16						1-4		老生物楼324
01130320	普通生物学实验（B） General Biology Lab (B)	1.0	34.0	侯巧明	40	2-16						5-8		老生物楼324
01130780	生物进化论 Biological Evolution	2.0	34.0	颜红雅	200	1-16		7-8						
10871	人类的性、生育与健康 Human Sex, Reproduction and Health	2.0	34.0	姚锦仙	480	1-16	5-6							第一周电影报告厅上课
10960	保护生物学 Conservation Biology	2.0	34.0	吕植	200	1-16			10-11					
19350	普通生物学(B) General Biology (B)	2.0	30.0	陶伟	300	1-16								

2011-2012 semester 2:

http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=11-12&xq=2



02131410	中世纪西欧社会史 Social History of Medieval Western Europe	2.0	34.0	黄春高	150	1-17	10-11							
02132750	中国通史 (古代部分) General History of China, 2100B.C. - A.D.1840	2.0	32.0	李新峰	150	1-17	10-11							
02138970	中国古代妇女史专题 Selected Topics in Women's History of Ancient China	2.0	34.0	李志生	150	1-17			5-6					
02132250	中国近代政治与外交 Politics and Diplomacy of Modern China	2.0	32.0	邹卫东	80	1-17				5-6				本系限选
02138840	中国近代思想史 The History of Modern Chinese Thought	2.0	32.0	欧阳哲生	150	1-17			10-11					本系限选
02131220	欧洲文艺复兴 Renaissance Europe	2.0	34.0	朱孝远	240	1-17		10-11						本系限选
02131270	欧洲启蒙运动 The Enlightenment	2.0	34.0	高毅	150	1-17				10-11				本系限选
02131460	拉美国家现代化进程研究 Theories and Process: The Modernization of Latin America	2.0	34.0	董经胜	150	1-17				5-6				本系限选
02131810	伊斯兰教与现代世界 Islam and Modern World	2.0	32.0	昝涛	150	1-16	5-6							本科选修
02231310	世界遗产概论 Introduction to World Heritage	2.0	32.0	张成渝	110	1-16				5-6				
02330000	哲学导论 Introduction to Philosophy	2.0	32.0	李超杰	180	1-17		10-11						本系及双学位不可选
02330030	逻辑导论 Introduction to Logic	3.0	51.0	陈波	200	1-16	5-6双周		10-11					
02330050	西方哲学导论 Introduction to Western Philosophy	2.0	32.0	曾忠	120	1-17		10-11						本系及双学位不可选
02330142	伦理学导论 Introduction to Ethics	2.0	32.0	王海明	140	1-16	10-11							本系学生不可选
02330840	中国美学史 History of Chinese Aesthetics	2.0	32.0	王德胜	100	1-17	10-11							
02331310	逻辑与批判性思维 Logic and Critical Thinking	3.0	54.0	刘壮虎	180	1-16		5-6双周		10-11				
02332336	中国佛教史 History of Chinese Buddhism	2.0	32.0	周学农	305	1-17			5-6					
02333371	政治哲学 Political Philosophy	2.0	34.0	韩水法	160	1-17			10-11					
02333830	文化哲学与文化产业 Cultural Philosophy and Cultural Industries	2.0	32.0	陈少峰	400	1-17			10-11					
16161	西方思想经典（二） Classics in Western Intellectual II	2.0	32.0	黄飞	100	1-17				5-6				
15220	《四书》精读 Intensive Reading of the Four Books	2.0	32.0	杨立华	120	1-17			10-11					
11560	美国文化与社会 American Culture and Society	2.0	36.0	袁明	400	1-17			10-11					
11580	中国政治概论 Outline of The Chinese Politics	2.0	34.0	杨鹏照	100	1-17								

2011-2012 semester 3:

http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=11-12&xq=3



北京大学教务部
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11-12-3本科生通选课课表 (Courses for General Education)

课程编号 Course Code	课程名 Course	学分 Credits	总学时 Hours	教师 Teacher	人数 Capacity	起止周 Lecture Weeks	星期一 MON	星期二 TUE	星期三 WED	星期四 THU	星期五 FRI	星期六 SAT	星期日 SUN	备注Notes
01233170	地震概论 Introduction to Seismology	2.0	32.0	赵克常	400	1-4	1-2	1-2	1-2	1-2				7月26日考试
02332311	佛教导论 An Introdution to Buddhism	2.0	32.0	姚卫群	180	1-2	1-4	1-4		1-4	1-4			
02431590	印度社会与文化 Indian Society and Culture	2.0	34.0	陈峰君	60	1-5		5-8		5-8				第五周论文考试
02431710	亚太概论 Introduction to Asia-Pacific Outline	2.0	34.0	陈峰君	60	1-5		1-4		1-4				第五周论文考试
02533160	经济学原理（I）Principles of Economics (I)	3.0	45.0	胡涛	150	1-4	2-4		2-4		2-4			
03032360	中国文化史 History of Chinese Culture	2.0	32.0	王锦贵	100	1-2	1-4	1-4	1-4	1-4				
03530190	日本文化艺术专题 The Special Topic on Japanese Culture and Art	2.0	32.0	滕军	300	1-2	9-12	9-12		9-12	9-12			最后一次课随堂考
04330881	基本乐理与管弦乐基础 Basic Theory of Music and The Basics of Orchestral Music	2.0	32.0	马清	250	1-5	1-4		1-4					

2012-2013 semester 1:

http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=12-13&xq=1



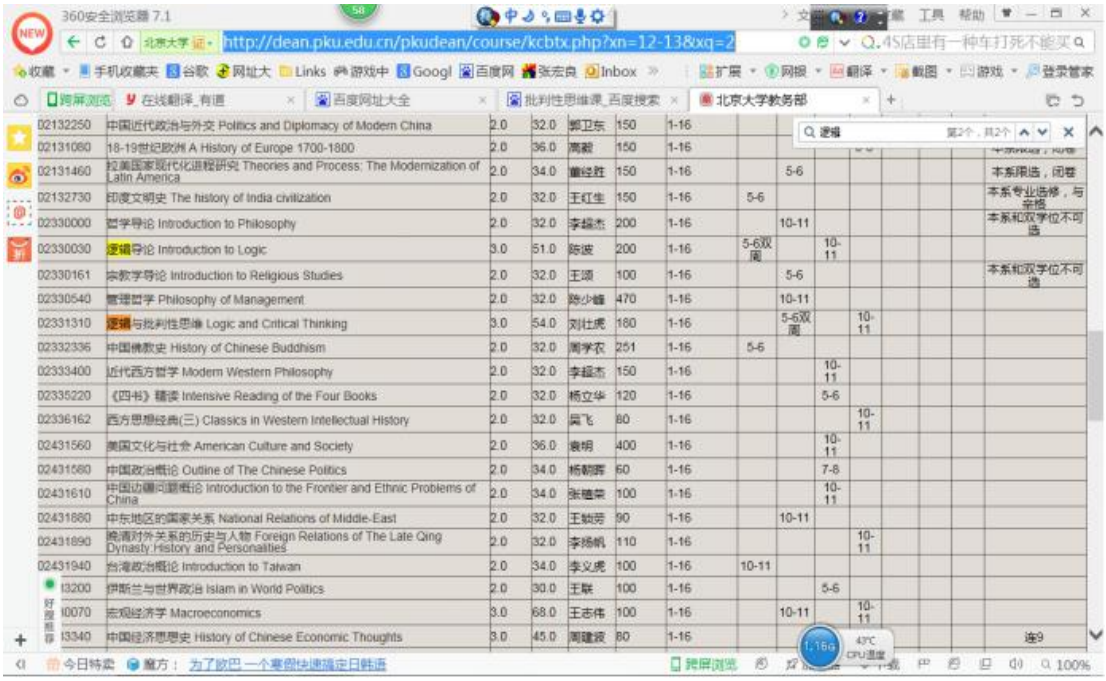
北京大学教务部
Office of Educational Administration

12-13-1本科生通选课课表 (Courses for General Education)

课程编号 Course Code	课程名 Course	学分 Credits	总学时 Hours	教师 Teacher	人数 Capacity	起止周 Lecture Weeks	星期一 MON	星期二 TUE	星期三 WED	星期四 THU	星期五 FRI	星期六 SAT	星期日 SUN	备注Notes
00131560	古今数学思想 Mathematical Thought from Ancient to Modern Times	2.0	34.0	范辰宏	180	1-17				7-8				
00136540	数值方法：原理，算法及应用 Numerical Methods: Principles, Algorithms and Applications	3.0	51.0	骆华中	90	1-17		3-4		7-8单周				
00136700	普通统计学 Statistics	3.0	51.0	耿直	180	1-17	7-8		7-8双周					
00432270	大气概论 Introduction to Atmosphere	2.0	30.0	李万彪	100	1-17	5-6							
00434091	纳米科学前沿 Frontier of Nano-Science and Technology	2.0	32.0	俞大鹏	100	1-17			5-6					
01033090	今日新材料 New Materials Today	2.0	32.0	李星国	100	1-17				7-8				
01033100	功能化学 Chemical Function of Materials	2.0	32.0	邹德春	50	1-17		7-8						
01034030	魅力化学 Fascinating Chemistry	2.0	32.0	黄建滨	200	1-17	7-8							
01034040	化学与社会 Chemistry and Society	2.0	32.0	卞江	80	1-17			7-8					文科学生
01035090	大学化学 College Chemistry	3.0	48.0	卞祖强	80	1-17	10-12							非化学类的理科生
01130320	普通生物学实验（B） General Biology Lab (B)	1.0	34.0	施新猛	40	2-16						1-4		老生物楼226
01130320	普通生物学实验（B） General Biology Lab (B)	1.0	34.0	施新猛	40	2-16						5-8		老生物楼226
01130780	生物进化论 Biological Evolution	2.0	34.0	颜江雁	200	1-15		7-8						
10871	人类的性、生育与健康 Human Sex, Reproduction and Health	2.0	34.0	姚倩仙	480	1-17	7-8							
10960	保护生物学 Conservation Biology	2.0	34.0	吕植	200	1-16			10-11					
19350	普通生物学(B) General Biology (B)	2.0	30.0	陶伟	290	1-17								

2012-2013 semester 2:

http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=12-13&xq=2



02132250	中国近代政治与外交 Politics and Diplomacy of Modern China	2.0	32.0	郭卫东	150	1-16						
02131080	18-19世纪欧洲 A History of Europe 1700-1800	2.0	36.0	高毅	150	1-16						
02131460	拉美国家现代化进程研究 Theories and Process: The Modernization of Latin America	2.0	34.0	董经胜	150	1-16		5-6				本系限选，闭卷
02132730	印度文明史 The history of India civilization	2.0	32.0	王红生	150	1-16	5-6					本系专业选修，与辛格
02330000	哲学导论 Introduction to Philosophy	2.0	32.0	李超杰	200	1-16		10-11				本系和双学位不可选
02330030	逻辑导论 Introduction to Logic	3.0	51.0	陈波	200	1-16	5-6双周		10-11			
02330161	宗教学导论 Introduction to Religious Studies	2.0	32.0	王颂	100	1-16		5-6				本系和双学位不可选
02330540	管理哲学 Philosophy of Management	2.0	32.0	陈少峰	470	1-16		10-11				
02331310	逻辑与批判性思维 Logic and Critical Thinking	3.0	54.0	刘壮虎	160	1-16		5-6双周		10-11		
02332336	中国佛教史 History of Chinese Buddhism	2.0	32.0	周学农	251	1-16	5-6					
02333400	近代西方哲学 Modern Western Philosophy	2.0	32.0	李超杰	150	1-16			10-11			
02335220	《四书》精读 Intensive Reading of the Four Books	2.0	32.0	杨立华	120	1-16			5-6			
02336162	西方思想经典(三) Classics in Western Intellectual History	2.0	32.0	吴飞	80	1-16				10-11		
02431560	美国文化与社会 American Culture and Society	2.0	36.0	袁明	400	1-16			10-11			
02431580	中国政治概论 Outline of The Chinese Politics	2.0	34.0	杨朝辉	60	1-16			7-8			
02431610	中国边疆问题概论 Introduction to the Frontier and Ethnic Problems of China	2.0	34.0	张植荣	100	1-16			10-11			
02431880	中东地区的国家关系 National Relations of Middle-East	2.0	32.0	王铁劳	90	1-16		10-11				
02431890	晚清对外关系的历史与人物 Foreign Relations of The Late Qing Dynasty: History and Personalities	2.0	32.0	李扬帆	110	1-16				10-11		
02431940	台湾政治概论 Introduction to Taiwan	2.0	34.0	李义虎	100	1-16	10-11					
I3200	伊斯兰与世界政治 Islam in World Politics	2.0	30.0	王联	100	1-16			5-6			
I0070	宏观经济学 Macroeconomics	3.0	68.0	王志伟	100	1-16		10-11		10-11		
I3340	中国经济思想史 History of Chinese Economic Thoughts	3.0	45.0	周建波	80	1-16						连9

2012-2013 semester 3:

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北京大学教务部
Office of Educational Administration

部门介绍 本科招生 教学与培养 学籍管理 教务管理 教学评估 交流合作 暑期学校

12-13-3本科生通选课课表 (Courses for General Education)

课程编号 Course Code	课程名 Course	学分 Credits	总学时 Hours	教师 Teacher	人数 Capacity	起止周 Lecture Weeks	星期一 MON	星期二 TUE	星期三 WED	星期四 THU	星期五 FRI	星期六 SAT	星期日 SUN	备注Notes
01233170	地震概论 Introduction to Seismology	2.0	32.0	赵克常	200	1-4	1-2	1-2	1-2	1-2				8月1日考试
02033970	《庄子内篇》解读 Intensive Reading of the " Zhuangzi's Inner Chapters"	2.0	32.0		30	1-2	1-3	1-3	1-3	1-3	1-3			陈旭,周五1-4节上
02034120	批评理论导论 Introduction to Critical Theory	2.0	32.0		0	1-4		1-4		1-4				张旭东,手动选课
02332311	佛教导论 An Introdution to Buddhism	2.0	32.0	姚卫群	210	1-2	1-4	1-4		1-4	1-4			
02431590	印度社会与文化 Indian Society and Culture	2.0	34.0	陈峰君	80	1-4	1-4			1-4				最后一次课 随堂考试
02530060	微观经济学 Microeconomics	3.0	68.0	张元鹏	60	1-5				2-4	2-4			周四,五2-4和10-12节
02533160	经济学原理（I）Principles of Economics (I)	3.0	45.0	张元鹏	60	1-5	2-4	2-4						周一,二2-4和10-12节
03032360	中国文化史 History of Chinese Culture	2.0	32.0	王锦贵	60	1-2	1-4	1-4	1-4	1-4				
03530190	日本文化艺术专题 The Special Topic on Japanese Culture and Art	2.0	32.0	滕军	300	1-2	9-12	9-12		9-12	9-12			7月19日最后一次课
04330681	基本乐理与管弦乐基础 Basic Theory of Music and The Basics of Orchestral Music	2.0	32.0	马清	170	1-4	1-4		1-4					

2013-2014 semester 1:

http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=13-14&xq=1



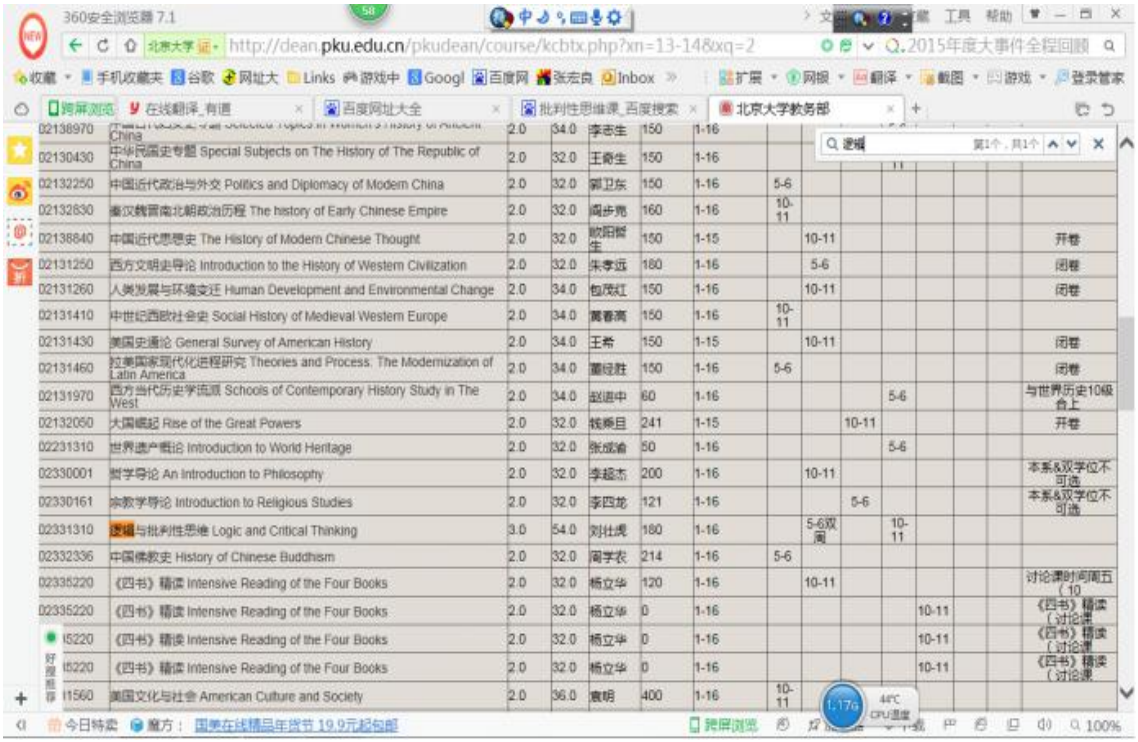
北京大学教务部
Office of Educational Administration

13-14-1本科生通选课课表 (Courses for General Education)

课程编号 Course Code	课程名 Course	学分 Credits	总学时 Hours	教师 Teacher	人数 Capacity	起止周 Lecture Weeks	星期一 MON	星期二 TUE	星期三 WED	星期四 THU	星期五 FRI	星期六 SAT	星期日 SUN	备注Notes
00136540	数值方法：原理，算法及应用 Numerical Methods: Principles, Algorithms and Applications	3.0	51.0	汤华中	90	1-16	7-8		3-4双周					
00136700	普通统计学 Statistics	3.0	51.0	耿直	180	1-16	7-8		7-8双周					
00430109	演示物理学 Demonstration Physics	2.0	32.0	穆良柱	30	1-16	5-6							
00432268	自然科学中的混沌和分形 Chaos and Fractal in Natural Sciences	2.0	32.0	梁福明	50	1-16				5-6				
00432270	大气概论 Introduction to Atmosphere	2.0	30.0	李万彪	120	1-16	5-6							
00434091	纳米科学前沿 Frontier of Nano--Science and Technology	2.0	32.0	俞大鹏	100	1-16			5-6					
00437170	公共物理学 Physics for General Public	2.0	32.0	王晓纲	90	1-16		5-6						上课时间周二5-6节
01033090	今日新材料 New Materials Today	2.0	32.0	李星国	100	1-16				7-8				
01033100	功能化学 Chemical Function of Materials	2.0	32.0	邹德春	50	1-16		7-8						
01034030	魅力化学 Fascinating Chemistry	2.0	32.0	黄建滨	200	1-16	7-8							
01034040	化学与社会 Chemistry and Society	2.0	32.0	卞江	80	1-16			7-8					文科学生
01035090	大学化学 College Chemistry	3.0	48.0	卞祖强	80	1-16	10-12							非化学类的理科生
01130320	普通生物学实验（B） General Biology Lab (B)	1.0	34.0	贺新强	40	1-16						1-4		老生物楼226
10780	生物进化论 Biological Evolution	2.0	34.0	颜红雅	300	1-15		7-8						
10671	人类的性、生育与健康 Human Sex, Reproduction and Health	2.0	34.0	姚锡仙	480	1-16	10-11							
10671	人类的性、生育与健康 Human Sex, Reproduction and Health	2.0	34.0	姚锡仙	480	1-16								

2013-2014 semester 2:

http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=13-14&xq=2



02138970	China	2.0	34.0	李志生	150	1-16								
02130430	中华民国史专题 Special Subjects on The History of The Republic of China	2.0	32.0	王奇生	150	1-16								
02132250	中国近代政治与外交 Politics and Diplomacy of Modern China	2.0	32.0	郭卫东	150	1-16	5-6							
02132830	秦汉魏晋南北朝政治历程 The history of Early Chinese Empire	2.0	32.0	阎步克	160	1-16	10-11							
02138840	中国近代思想史 The History of Modern Chinese Thought	2.0	32.0	欧阳哲生	150	1-15		10-11						开卷
02131250	西方文明史导论 Introduction to the History of Western Civilization	2.0	32.0	朱孝远	180	1-16		5-6						闭卷
02131260	人类发展与环境变迁 Human Development and Environmental Change	2.0	34.0	包茂红	150	1-16		10-11						闭卷
02131410	中世纪西欧社会史 Social History of Medieval Western Europe	2.0	34.0	黄春高	150	1-16	10-11							
02131430	美国史通论 General Survey of American History	2.0	34.0	王希	150	1-15		10-11						闭卷
02131460	拉美国家现代化进程研究 Theories and Process: The Modernization of Latin America	2.0	34.0	董经胜	150	1-16	5-6							闭卷
02131970	西方当代历史学流派 Schools of Contemporary History Study in The West	2.0	34.0	赵国中	60	1-16				5-6				与世界历史10级合上
02132050	大国崛起 Rise of the Great Powers	2.0	32.0	钱乘旦	241	1-15			10-11					开卷
02231310	世界遗产概论 Introduction to World Heritage	2.0	32.0	张成渝	50	1-16				5-6				
02330001	哲学导论 An Introduction to Philosophy	2.0	32.0	李超杰	200	1-16		10-11						本系&双学位不可选
02330161	宗教学导论 Introduction to Religious Studies	2.0	32.0	李四龙	121	1-16			5-6					本系&双学位不可选
02331310	逻辑与批判性思维 Logic and Critical Thinking	3.0	54.0	刘壮虎	180	1-16		5-6双周		10-11				
02332336	中国佛教史 History of Chinese Buddhism	2.0	32.0	阎孝农	214	1-16	5-6							
02335220	《四书》精读 Intensive Reading of the Four Books	2.0	32.0	杨立华	120	1-16		10-11						讨论课时间周五（10
02335220	《四书》精读 Intensive Reading of the Four Books	2.0	32.0	杨立华	0	1-16				10-11				《四书》精读（讨论课
05220	《四书》精读 Intensive Reading of the Four Books	2.0	32.0	杨立华	0	1-16				10-11				《四书》精读（讨论课
05220	《四书》精读 Intensive Reading of the Four Books	2.0	32.0	杨立华	0	1-16				10-11				《四书》精读（讨论课
11560	美国文化与社会 American Culture and Society	2.0	36.0	袁明	400	1-16	10-11							

2013-2014 semester 3:

http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=13-14&xq=3



北京大学教务部
Office of Educational Administration

13-14-3本科生通选课课表 (Courses for General Education)

课程编号 Course Code	课程名 Course	学分 Credits	总学时 Hours	教师 Teacher	人数 Capacity	起止周 Lecture Weeks	星期一 MON	星期二 TUE	星期三 WED	星期四 THU	星期五 FRI	星期六 SAT	星期日 SUN	备注Notes
01233170	地震概论 Introduction to Seismology	2.0	32.0	赵克常	150	1-4	1-2	1-2	1-2	1-2				通选课A级城。7月2
02030330	民俗学 Folklore	2.0	34.0	陈泳超	70	1-4	1-4	1-4						考试方式：写论文
02131810	伊斯兰教与现代世界 Islam and Modern World	2.0	32.0	普涛	70	1-4	3-4	3-4	3-4	3-4				7月29日上午3、4
02332311	佛教导论 An Introdution to Buddhism	2.0	32.0	姚卫群	200	1-2	1-4	1-4		1-4	1-4			最后一次课随堂开卷考
02431710	亚太概论 Introduction to Asia-Pacific Outline	2.0	34.0	陈峰君	70	1-4		1-4		1-4				第五周周二上课时间数
02530060	微观经济学 Microeconomics	3.0	68.0	张元鹏	100	1-4	6-9	6-9		6-9	6-9			
03032360	中国文化史 History of Chinese Culture	2.0	32.0	王锦贵	90	1-2	1-4	1-4	1-4	1-4				7月10日3－4节考
03130400	教育社会学思考 The Thinking of Sociology of Education	2.0	36.0	钱民辉	110	1-4		1-4			1-4			论文
03530190	日本文化艺术专题 The Special Topic on Japanese Culture and Art	2.0	32.0	静军	300	1-2	8-11	8-11		8-11	8-11			考试时间：7月11日
04330881	基本乐理与管弦乐基础 Basic Theory of Music and The Basics of Orchestral Music	2.0	32.0	马清	120	1-4	1-4		1-4					

2014-2015 semester 1:

http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=14-15&xq=1



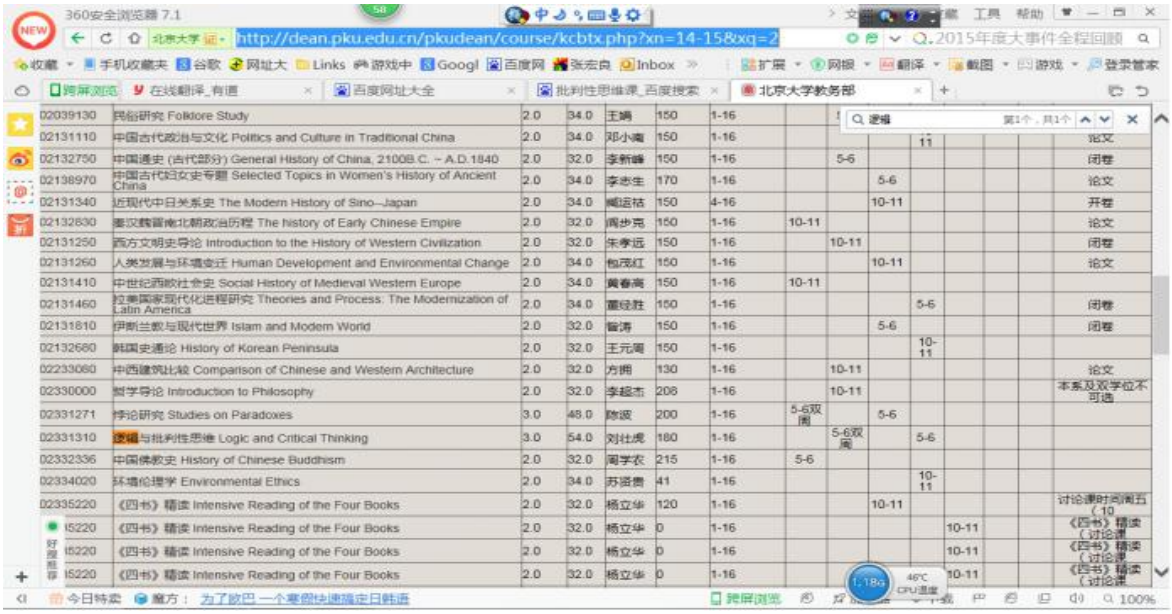
北京大学教务部
Office of Educational Administration

14-15-1本科生通选课课表 (Courses for General Education)

课程编号 Course Code	课程名 Course	学分 Credits	总学时 Hours	教师 Teacher	人数 Capacity	起止周 Lecture Weeks	星期一 MON	星期二 TUE	星期三 WED	星期四 THU	星期五 FRI	星期六 SAT	星期日 SUN	备注Notes
00136540	数值方法：原理，算法及应用 Numerical Methods: Principles, Algorithms and Applications	3.0	51.0	汤华中	90	1-16		3-4		1-2双周				
00136700	普通统计学 Statistics	3.0	51.0	耿直	90	1-16	7-8		7-8双周					
00430109	演示物理学 Demonstration Physics	2.0	32.0	李湘庆	30	1-16	5-6							
00432268	自然科学中的混沌和分形 Chaos and Fractal in Natural Sciences	2.0	32.0	梁福明	60	1-16				5-6				
00432270	大气概论 Introduction to Atmosphere	2.0	30.0	李万彪	120	1-16	5-6							
00434091	纳米科学前沿 Frontier of Nano--Science and Technology	2.0	32.0	俞大鹏	100	1-16				5-6				
01033090	今日新材料 New Materials Today	2.0	32.0	李星国	100	1-16			7-8					
01033100	功能化学 Chemical Function of Materials	2.0	32.0	邹德春	80	1-16		7-8						
01034030	魅力化学 Fascinating Chemistry	2.0	32.0	黄建滨	200	1-16	7-8							
01034040	化学与社会 Chemistry and Society	2.0	32.0	卞江	80	1-16			5-6					文管类学生，录像
01035090	大学化学 College Chemistry	3.0	48.0	卞祖强	80	1-16	10-12							非化学类的理科生
01130311	普通生物学实验 General Biology Lab	2.0	64.0	贺新强	32	1-16						1-4		一补录，老生物验2
10780	生物进化论 Biological Evolution	2.0	34.0	魏红雅	200	1-15		7-8						
10671	人类的性、生育与健康 Human Sex, Reproduction and Health	2.0	34.0	琚锦仙	480	1-16	10-11							
10671	人类的性、生育与健康 Human Sex, Reproduction and Health	2.0	34.0	琚锦仙	480	1-16		10-						

2014-2015 semester 2:

http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=14-15&xq=2



02039130	民俗研究 Folklore Study	2.0	34.0	王娟	150	1-16				11				
02131110	中国古代政治与文化 Politics and Culture in Traditional China	2.0	34.0	邓小南	150	1-16								论文
02132750	中国通史 (古代部分) General History of China, 2100B.C. – A.D.1840	2.0	32.0	李新峰	150	1-16		5-6						闭卷
02138970	中国古代妇女史专题 Selected Topics in Women's History of Ancient China	2.0	34.0	李志生	170	1-16			5-6					论文
02131340	近现代中日关系史 The Modern History of Sino-Japan	2.0	34.0	臧运祜	150	4-16			10-11					开卷
02132630	秦汉魏晋南北朝政治历程 The history of Early Chinese Empire	2.0	32.0	阎步克	150	1-16	10-11							论文
02131250	西方文明史导论 Introduction to the History of Western Civilization	2.0	32.0	朱孝远	150	1-16		10-11						闭卷
02131260	人类发展与环境变迁 Human Development and Environmental Change	2.0	34.0	包茂红	150	1-16			10-11					论文
02131410	中世纪西欧社会史 Social History of Medieval Western Europe	2.0	34.0	黄春高	150	1-16	10-11							
02131460	拉美国家现代化进程研究 Theories and Process: The Modernization of Latin America	2.0	34.0	董经胜	150	1-16				5-6				闭卷
02131810	伊斯兰教与现代世界 Islam and Modern World	2.0	32.0	智涛	150	1-16			5-6					闭卷
02132660	韩国史通论 History of Korean Peninsula	2.0	32.0	王元周	150	1-16				10-11				
02233060	中西建筑比较 Comparison of Chinese and Western Architecture	2.0	32.0	方拥	130	1-16		10-11						论文
02330000	哲学导论 Introduction to Philosophy	2.0	32.0	李超杰	206	1-16		10-11						本系及双学位不可选
02331271	悖论研究 Studies on Paradoxes	3.0	48.0	陈波	200	1-16	5-6双周		5-6					
02331310	逻辑与批判性思维 Logic and Critical Thinking	3.0	54.0	刘壮虎	180	1-16		5-6双周		5-6				
02332336	中国佛教史 History of Chinese Buddhism	2.0	32.0	周学农	215	1-16	5-6							
02334020	环境伦理学 Environmental Ethics	2.0	34.0	苏贵贵	41	1-16				10-11				
02335220	《四书》精读 Intensive Reading of the Four Books	2.0	32.0	杨立华	120	1-16			10-11					讨论课时间周五（10
I5220	《四书》精读 Intensive Reading of the Four Books	2.0	32.0	杨立华	0	1-16					10-11			《四书》精读（讨论课
I5220	《四书》精读 Intensive Reading of the Four Books	2.0	32.0	杨立华	0	1-16					10-11			《四书》精读（讨论课
I5220	《四书》精读 Intensive Reading of the Four Books	2.0	32.0	杨立华	0	1-16					10-11			《四书》精读（讨论课

2014-2015 semester 3:

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北京大学教务部
Office of Educational Administration

部门介绍 本科招生 教学与培养 学籍管理 教务管理 教学评估 交流合作 暑期学校

14-15-3本科生通选课课表 (Courses for General Education)

课程编号 Course Code	课程名 Course	学分 Credits	总学时 Hours	教师 Teacher	人数 Capacity	起止周 Lecture Weeks	星期一 MON	星期二 TUE	星期三 WED	星期四 THU	星期五 FRI	星期六 SAT	星期日 SUN	备注Notes
01233170	地震概论 Introduction to Seismology	2.0	32.0	赵克常	110	1-5	1-2	1-2	1-2	1-2				8月6日考试
02131810	伊斯兰教与现代世界 Islam and Modern World	2.0	32.0	智涛	105	1-4	3-4	3-4	3-4	3-4				8.11闭卷考试
02332311	佛教导论 An Introdution to Buddhism	2.0	32.0	姚卫群	182	1-2	1-4	1-4		1-4	1-4			
02431710	亚太概论 Introduction to Asia-Pacific Outline	2.0	34.0	陈峰君	70	1-4	1-4			1-4				论文
02530060	微观经济学 Microeconomics	3.0	68.0	张元鹏	70	1-4	6-9	6-9		6-9	6-9			
03032360	中国文化史 History of Chinese Culture	2.0	32.0	王锦贵	120	1-2	1-4	1-4	1-4	1-4				
03130400	教育社会学思考 The Thinking of Sociology of Education	2.0	36.0	钱民辉	50	1-4			5-8	5-8				
04330881	基本乐理与管弦乐基础 Basic Theory of Music and The Basics of Orchestral Music	2.0	32.0	马清	168	1-4		1-4		1-4				
04331020	中外名曲赏析 Appreciation of Chinese and Foreign Famous Songs	2.0	32.0	李静	168	1-4	1-4		1-4					

2015-2016 semester 1:

http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=15-16&xq=1



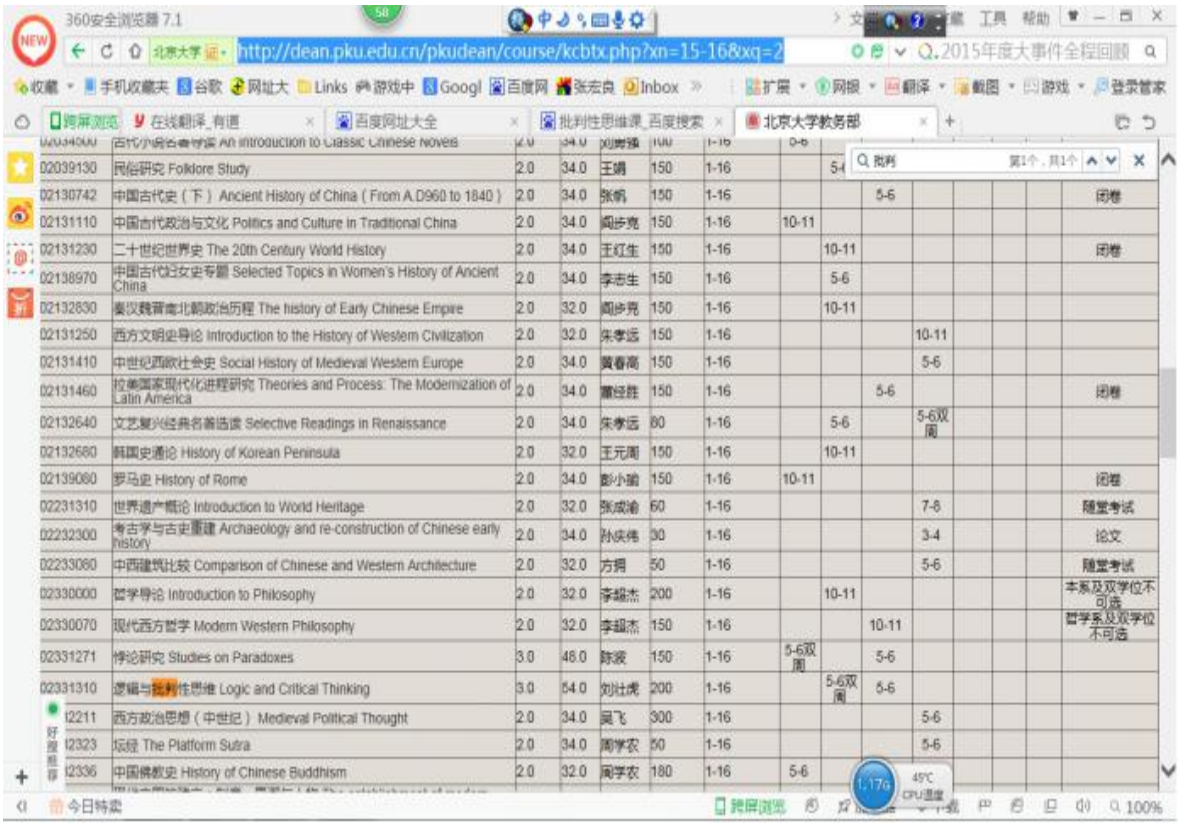
北京大学教务部
Office of Educational Administration

15-16-1本科生通选课课表 (Courses for General Education)

课程编号 Course Code	课程名 Course	学分 Credits	总学时 Hours	教师 Teacher	人数 Capacity	起止周 Lecture Weeks	星期一 MON	星期二 TUE	星期三 WED	星期四 THU	星期五 FRI	星期六 SAT	星期日 SUN	备注Notes
00136540	数值方法：原理，算法及应用 Numerical Methods: Principles, Algorithms and Applications	3.0	51.0	汤华中	90	1-16		3-4		1-2双周				
00136700	普通统计学 Statistics	3.0	51.0	耿直	90	1-16	7-8		7-8双周					
00430109	演示物理学 Demonstration Physics	2.0	32.0	李湘庆	35	1-16	5-6							人文社科类专业同学优
00432268	自然科学中的混沌和分形 Chaos and Fractal in Natural Sciences	2.0	32.0	梁福明	60	1-16		5-6						
00432270	大气概论 Introduction to Atmosphere	2.0	30.0	李万彪	100	1-15	5-6							
01033090	今日新材料 New Materials Today	2.0	32.0	李星国	100	1-16			7-8					
01033100	功能化学 Chemical Function of Materials	2.0	32.0	邹德春	80	1-16		7-8						
01034030	魅力化学 Fascinating Chemistry	2.0	32.0	黄建滨	210	1-16	7-8							
01034040	化学与社会 Chemistry and Society	2.0	32.0	卞江	80	1-16			5-6					文管类学生
01035090	大学化学 College Chemistry	3.0	48.0	卞祖强	80	1-16	10-12							非化学类的理科生
01130311	普通生物学实验 General Biology Lab	2.0	64.0	贺新强	60	1-16						1-4		老生物楼226上课
01130311	普通生物学实验 General Biology Lab	2.0	64.0	贺新强	60	1-16						5-8		一补录，老生物楼2
10780	生物进化论 Biological Evolution	2.0	34.0	颜红雅	200	1-15		7-8						
10871	人类的性、生育与健康 Human Sex, Reproduction and Health	2.0	34.0	姚锦仙	480	1-16	10-11							
10960	保护生物学 Conservation Biology	2.0	34.0	吕植	200	1-16		10-11						
11130	矿产资源经济概论 Introduction to Economy of Mineral Resources	2.0	34.0	朱永峰	150	1-16								一补录

2015-2016 semester 2:

http://dean.pku.edu.cn/pkudean/course/kcbtx.php?xn=15-16&xq=2



02039130	民俗研究 Folklore Study	2.0	34.0	王娟	150	1-16		5-6						
02130742	中国古代史（下） Ancient History of China (From A.D960 to 1840)	2.0	34.0	张帆	150	1-16			5-6					闭卷
02131110	中国古代政治与文化 Politics and Culture in Traditional China	2.0	34.0	阎步克	150	1-16	10-11							
02131230	二十世纪世界史 The 20th Century World History	2.0	34.0	王红生	150	1-16		10-11						闭卷
02138970	中国古代妇女史专题 Selected Topics in Women's History of Ancient China	2.0	34.0	李志生	150	1-16		5-6						
02132830	秦汉魏晋南北朝政治历程 The history of Early Chinese Empire	2.0	32.0	阎步克	150	1-16		10-11						
02131250	西方文明史导论 Introduction to the History of Western Civilization	2.0	32.0	朱孝远	150	1-16				10-11				
02131410	中世纪西欧社会史 Social History of Medieval Western Europe	2.0	34.0	黄春高	150	1-16				5-6				
02131460	拉美国家现代化进程研究 Theories and Process: The Modernization of Latin America	2.0	34.0	董经胜	150	1-16			5-6					闭卷
02132640	文艺复兴经典名著选读 Selective Readings in Renaissance	2.0	34.0	朱孝远	80	1-16		5-6		5-6双周				
02132680	韩国史通论 History of Korean Peninsula	2.0	32.0	王元周	150	1-16		10-11						
02139080	罗马史 History of Rome	2.0	34.0	彭小瑜	150	1-16	10-11							闭卷
02231310	世界遗产概论 Introduction to World Heritage	2.0	32.0	张成渝	60	1-16				7-8				随堂考试
02232300	考古学与古史重建 Archaeology and re-construction of Chinese early history	2.0	34.0	孙庆伟	30	1-16				3-4				论文
02233080	中西建筑比较 Comparison of Chinese and Western Architecture	2.0	32.0	方拥	50	1-16				5-6				随堂考试
02330000	哲学导论 Introduction to Philosophy	2.0	32.0	李超杰	200	1-16		10-11						本系及双学位不可选
02330070	现代西方哲学 Modern Western Philosophy	2.0	32.0	李超杰	150	1-16			10-11					哲学系及双学位不可选
02331271	悖论研究 Studies on Paradoxes	3.0	48.0	陈波	150	1-16	5-6双周		5-6					
02331310	逻辑与批判性思维 Logic and Critical Thinking	3.0	54.0	刘壮虎	200	1-16		5-6双周	5-6					
12211	西方政治思想（中世纪） Medieval Political Thought	2.0	34.0	吴飞	300	1-16				5-6				
12323	坛经 The Platform Sutra	2.0	34.0	周学农	50	1-16				5-6				
12336	中国佛教史 History of Chinese Buddhism	2.0	32.0	周学农	180	1-16	5-6							

1.3 The link and screenshot showing conditions of the CT module offered by Tsinghua University:

http://cms.sem.tsinghua.edu.cn/semcms/semBKPYFAcn/49918.htm?tempContent=full



1.4 The link and screenshot showing conditions of the CT module offered by Tsinghua University:

http://cms.sem.tsinghua.edu.cn/semcms/xyxw1cn/52144.htm?tempContent=full



1.5 The link and screenshot showing background of the lecturer of the CT module of Tsinghua University:

http://cms.sem.tsinghua.edu.cn/semcms/hdybcn/60784.htm?tempContent=full



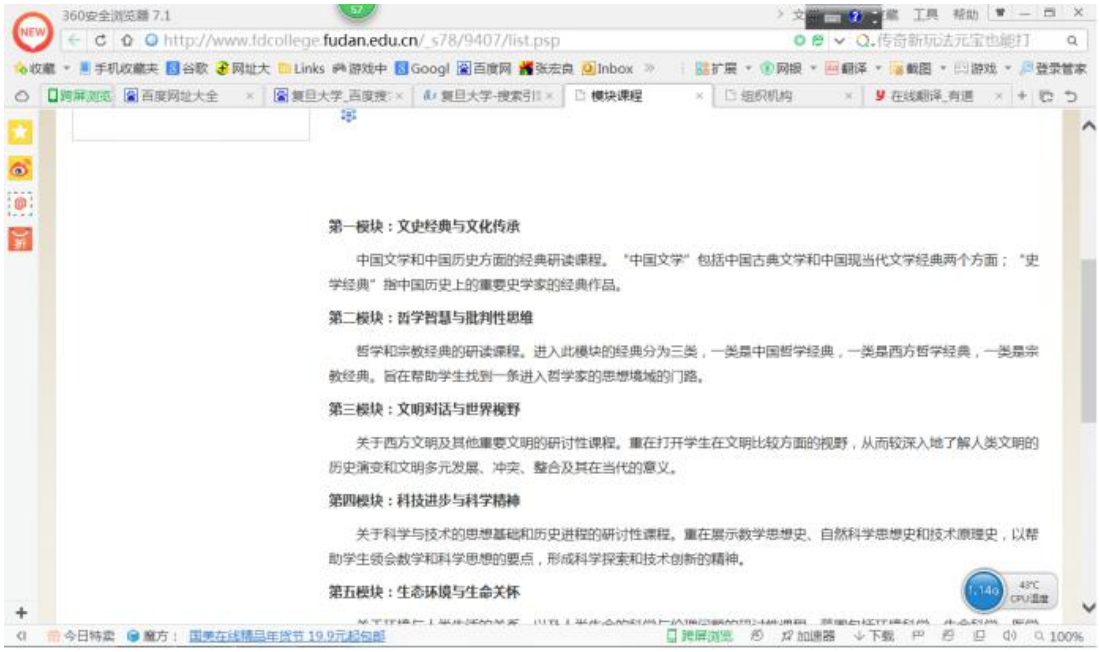
1.6 The link and screenshot showing content of an interview with the lecturer of the CT module of Tsinghua University:

http://cms.sem.tsinghua.edu.cn/semcms/xyxw1cn/52144.htm?tempContent=full



1.7 The link and screenshot showing conditions of the CT curriculum offered by Fudan University:

http://www.fdcollege.fudan.edu.cn/_s78/9406/list.psp



1.8 The logic module of Fudan University：

http://wenku.baidu.com/link?url=SrtRL6N1WGjRSnycE_ImYYgjgjDKIA4z6z5jAWdvBLEbINtGrQ17lej5tQntRq3AbzDcIN7LCl8aC5s-gX7K90egwp2ySYRHJTnJH3gWn_7



1.9 The link and screenshot showing conditions of the CT module offered by Huazhong University of Science and Technology：

http://qiming.hust.edu.cn/home/ArticleResult/40?&&articleid=111



1.10 The link and screenshot showing conditions of the CT module offered by Huazhong University of Science and Technology:

http://qiming.hust.edu.cn/home/ArticleResult/40?&&articleid=2074

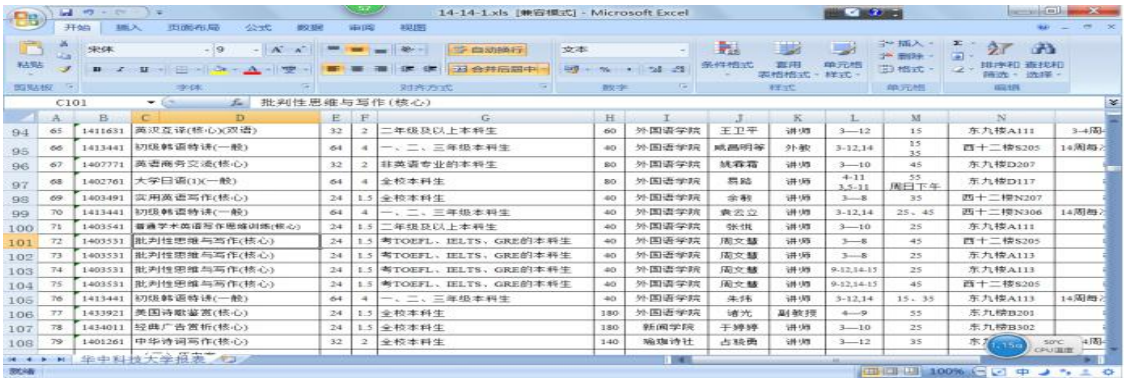


1.11 The link and screenshots showing conditions of the CT module offered by Huazhong University of Science and Technology:

http://jwc.hust.edu.cn/show/article/listMoreArticle?type=fwzq_kbcx_1&page=1









1.12 The link and screenshot showing conditions of the CT module offered by Renmin University:

http://phi.ruc.edu.cn/displaynews.php?id=827



1.13

Links showing conditions of the CT module offered by Renmin University

http:// phi.ruc.edu.cn/29-12011GF419.doc

http://isbrt.ruc.edu.cn/dept/teacher/logic/yangwujin/200409/259.html

Note: the content of the links became not available before I saved the screenshots of them.

1.14 The link and screen content showing background of the lecturer of the online CT module of Renmin University:

http://phi.ruc.edu.cn/displaynews2.php?id=131



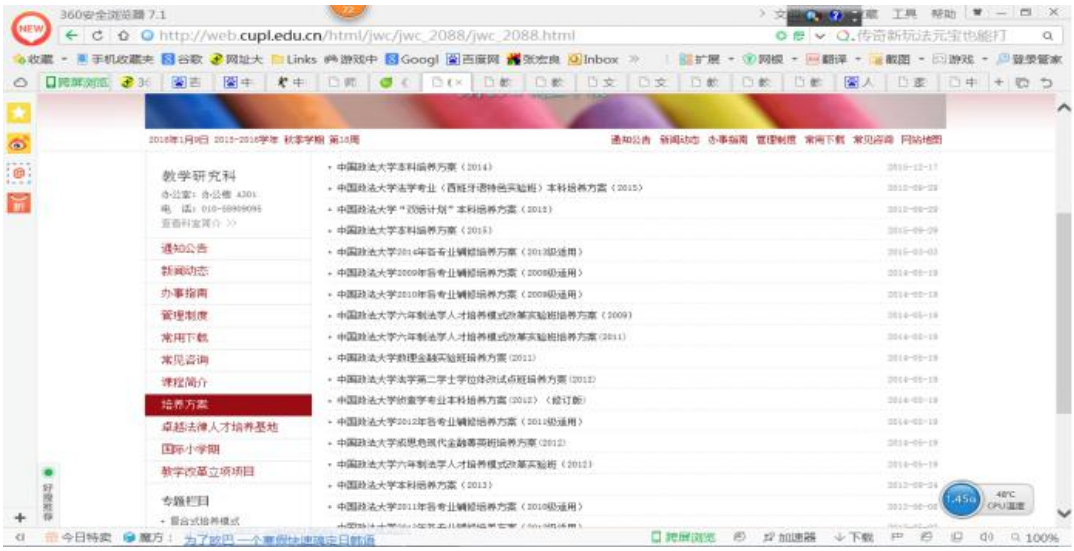
1.15 The link and screen content showing the textbook and learners' comments of the online CT module of Renmin University:

http://mooc.chaoxing.com/course/58200.html#courseArticle_33809



1.16 The link and screen content showing conditions of the CT module of China University of Political Science and Law:

http://web.cupl.edu.cn/html/jwc/jwc_2088/jwc_2088.html



1.17 The link and screen content showing the background of the lecturer of the CT module of China University of Political Science and Law:

http://daxue.netbig.com/59/teacher/346391/



1.18 The link and screen content showing class size of the CT module of China University of Political Science and Law:

http://web.cupl.edu.cn/html/jwc/jwc_2052/20130619105820326668086/20130619105820326668086.html



1.19 The link and screenshot showing conditions of the CT module of Nanjing University

http://jw.nju.edu.cn/EduContentList.aspx?MType=PX-SSZJGZQ-PYFAJXJH&FType=SSZJGZQ&res_type=eInfo



1.20 The link and screenshot showing conditions of the CT module of Nanjing University

http://jw.nju.edu.cn/EduContentList.aspx?MType=PX-SSZJGZQ-PYFAJXJH&FType=SSZJGZQ&res_type=eInfo



1.21 The link and screenshot showing background of the lecturer of the CT module of China Youth University of Political Studies

http://zwx.cyu.edu.cn/szdw/jsjj/201105/t20110506_21392.html



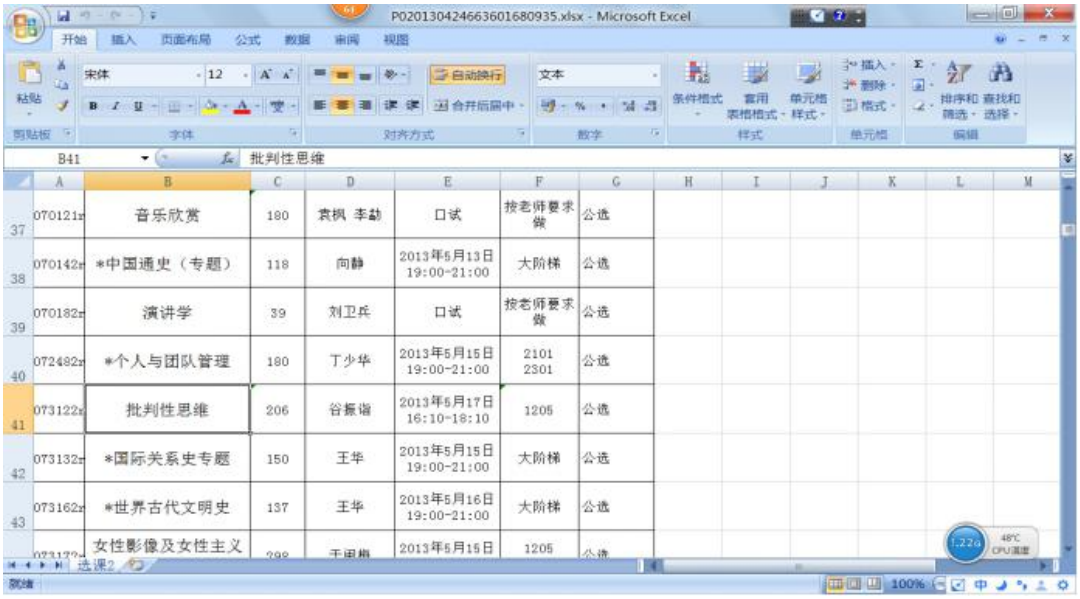
1.22 The link and screenshot showing: background of the lecturer of the CT module of China Youth University of Political Studies

http://zwx.cyu.edu.cn/xwdt/201206/t20120625_39128.html



1.23 The link and screenshot showing conditions of the CT module of China Youth University of Political Studies:

http://wyx.cyu.edu.cn/zxzx/jxtz/201304/P020130424663601680935.xlsx



1.24 The link and screenshot showing background of the lecturer of the CT module offered by Kankai University:

http://phil.nankai.edu.cn/phil/index.php?m=content&c=index&a=show&catid=24&id=23



1.25 The link and screenshots showing conditions of the CT module offered by Nankai University:

http://jwc.nankai.edu.cn/Download.asp?modid=5&subid=67

2012-2013 semester 1:



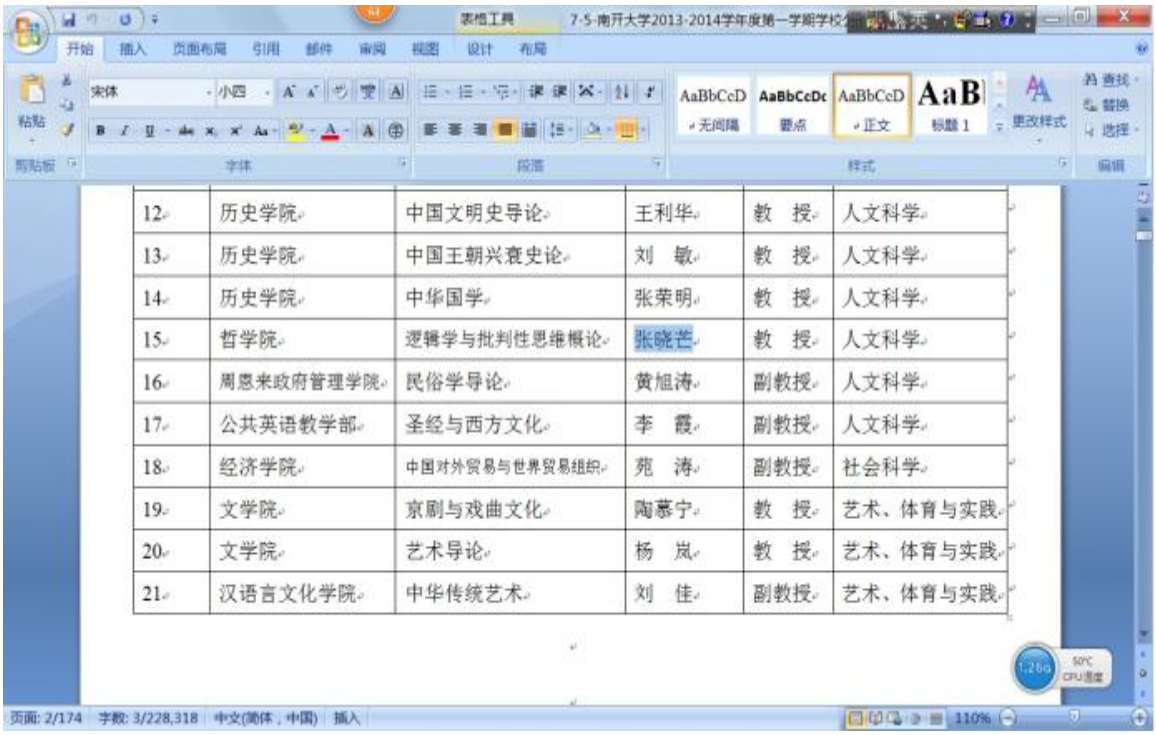
9.	环境科学与工程学院	环境保护概论	吴　婧	副教授	自然科学与技术
10.	文学院	现代中国文学名篇导读	李润霞	副教授	人文科学
11.	历史学院	世界文明史导论	陈志强	教　授	人文科学
12.	历史学院	中国文明史导论	王利华	教　授	人文科学
13.	历史学院	中国王朝兴衰史论	刘　敏	教　授	人文科学
14.	历史学院	中华国学	张荣明	教　授	人文科学
15.	哲学院	逻辑学与批判性思维概论	张晓芒	教　授	人文科学
16.	周恩来政府管理学院	民俗学导论	黄旭涛	副教授	人文科学
17.	公共英语教学部	圣经与西方文化	李　霞	副教授	人文科学

2012-2013 semester 2:



6.	生命科学学院	基础生命科学导论	张金红	教　授	自然科学与技术
7.	医学院	医学与人类健康	李玉皓	副教授	自然科学与技术
8.	环境科学与工程学院	海洋与人类文明	冯剑丰	副教授	自然科学与技术
9.	环境科学与工程学院	环境保护概论	吴　婧	副教授	自然科学与技术
10.	文学院	现代中国文学名篇导读	李润霞	副教授	人文科学
11.	历史学院	世界文明史导论	陈志强	教　授	人文科学
12.	历史学院	中国文明史导论	王利华	教　授	人文科学
13.	历史学院	中国王朝兴衰史论	刘　敏	教　授	人文科学
14.	历史学院	中华国学	张荣明	教　授	人文科学
15.	哲学院	逻辑学与批判性思维概论	张晓芒	教　授	人文科学
16.	周恩来政府管理学院	民俗学导论	黄旭涛	副教授	人文科学
17.	公共英语教学部	圣经与西方文化	李　霞	副教授	人文科学

2013-2014 semester 1:



12	历史学院	中国文明史导论	王利华	教 授	人文科学
13	历史学院	中国王朝兴衰史论	刘 敏	教 授	人文科学
14	历史学院	中华国学	张荣明	教 授	人文科学
15	哲学院	逻辑学与批判性思维概论	张晓芒	教 授	人文科学
16	周恩来政府管理学院	民俗学导论	黄旭涛	副教授	人文科学
17	公共英语教学部	圣经与西方文化	李 霞	副教授	人文科学
18	经济学院	中国对外贸易与世界贸易组织	苑 涛	副教授	社会科学
19	文学院	京剧与戏曲文化	陶慕宁	教 授	艺术、体育与实践
20	文学院	艺术导论	杨 岚	教 授	艺术、体育与实践
21	汉语言文化学院	中华传统艺术	刘 佳	副教授	艺术、体育与实践

2013-2014 semester 2:



10	文学院	现代中国文学名篇导读	李润霞	副教授	人文科学
11	历史学院	世界文明史导论	陈志强	教 授	人文科学
12	历史学院	中国文明史导论	王利华	教 授	人文科学
13	历史学院	中国王朝兴衰史论	刘 敏	教 授	人文科学
14	历史学院	中华国学	张荣明	教 授	人文科学
15	哲学院	逻辑学与批判性思维概论	张晓芒	教 授	人文科学
16	周恩来政府管理学院	民俗学导论	黄旭涛	副教授	人文科学
17	公共英语教学部	圣经与西方文化	李 霞	副教授	人文科学
18	经济学院	中国对外贸易与世界贸易组织	苑 涛	副教授	社会科学
19	文学院	京剧与戏曲文化	陶慕宁	教 授	艺术、体育与实践
20	文学院	艺术导论	杨 岚	教 授	艺术、体育与实践
21	汉语言文化学院	中华传统艺术	刘 佳	副教授	艺术、体育与实践

1.26 CT and learning independently

	Title and time	Quotes from the texts
1	九三学社上海高校八基层第 39 次联席会议在复旦大学举行 2008-06-18	在我国教育改革中，由于受传统教育思想的影响，缺乏相应的高校教师培训，高校的教学改革相当滞后。高校课堂教学基本上仍实行以教师为中心的大班授

		课制，教师讲授、学生记笔记、定期考试的方式。许多教师采用照本宣科的注入式教学方法，教学方法上还未有效地突出能力的培养，缺乏协作学习和团队精神的培养。理论课为主，实验课不仅课时少，而且往往难以保证实验的质量。这在一定程度上影响了学生实践能力、创新能力和批判性思维能力的发展。
2	对培养一流拔尖创新人才的思考 2012-10-10	儒家文化一贯倡导尊重师长，服膺四书五经的教导，崇拜孔子、孟子等圣人的权威，读书人做学问大抵是诠释圣人的话；怀疑以至推翻圣人的论断，则被认为“大逆不道”。另一方面，受到前苏联体制的影响，很长一段时间内还增加“领导代表真理”的舆论，并要求学生“听话出活”，“做一颗永不生锈的螺丝钉”。在这种文化和体制的影响下，青年学生的科学批判精神受到抑制，大多数人从娃娃开始逐步养成了崇拜权威的心态和迷信书本的习惯。
3	改革创新 培养卓越医生 2014 年 3 月 13 日	以教师为中心的教学方法，不见得学生没有学习积极性，不见得学生不刻苦学习，但培养出来的学生，总体而言，追随教材，追随现成知识和既有答案，习惯依从和遵循权威，发散性思维、批判性思维训练不足，创造性较差。相应流行的学术文化往往是以学生接受、遵从老师和权威观点为要。

4	不适应”给教育改革添动力 2013-04-10	要想上名校，必须接受流水线一样的考试训练，学生们成了背诵、记忆的“教育容器”，而不是学习上的创造者、探索者;社会化思维、批判性思维、自主性创新意识明显不足，视野狭窄，最终必然出现各种“不适应”。
5	“三三制”拔尖人才培养模式改革与探索 2014-04-04	全面推行研究性教学，将过去主要传授现成知识的教学模式，转移到以研究、探索为基础的教学上来。南京大学多年来一直着力进行研究性教学的探索与实践，拥有先进的理念和丰富的经验。在“拔尖班”中，学校将加大研究性教学的推广力度。所有的专业课均以小班形式授课，以研讨问题为主，重点发展学生的批判性思维，特别培养他们发现问题、解决问题的能力
6	加快建设中国特色现代高等教育努力实现高等教育的历史性跨越 2010-08-23	在人才培养中，要更加注重创新性，改变死记硬背的学习方式，增强学生的创新精神和创新能力，培养跨学科思维和批判性思维；
7	教育创新的硕果,群体智慧的结晶 2012-11-05	我们与各国教育相比，我国学生掌握基本知识和基本技能并不差。缺点是我们的学生缺乏创新思维、批判性思维;缺乏问题意识和质疑能力;我们的学生学习时间长，可以说，是牺牲了休息时间而取得的成绩，这样会损害学生的健康和其他能力。
8	深化高等教育改革走以提高质量为核心的内涵式发展道路 2012-05-16	不少学生仍然把分数、文凭作为学习的主要目的，缺乏自主学习的精神。要确立学生在学习中的主体地位，逐步改变以教师为中心的知识传授型教学方式，

		开设由学生和教师共同选题的自主学习课程，构建多元学习模式，加强学习策略和方法的训练指导，培养学生的批判性思维和创新能力，促进个性发展。
9	拓宽学生个性化成才通道 2013-05-01	由于应试教育的长期影响，学生习惯于接受知识的灌输，相信书本、相信经验、相信标准答案，普遍缺乏深入探究和独立思考的能力。批判性思维训练的缺失已成为制约拔尖创新人才培养的“瓶颈”。
10	我们该办什么样的大学 2013-10-09	南京大学校长陈骏说，由于长期处在应试教育的压力下，学生囿于书本、经验、标准答案，普遍缺乏主动探究能力和批判性思维，因而大学尤其要注重本科生个性化培养，为学生自主构建知识体系搭建平台。
11	知识、能力与素质并重 2012-10-19	我们在人才培养中仍然存在不可忽视的问题，特别是学生在独立思考、批判性思维、数理能力、艺术修养和道德判断等方面的能力未达到所期望的水平。

1.27 CT and innovative/creative thinking

	Title and time	Quotes from the texts

1	“拔尖计划”未来国际一流科学家的摇篮 2014-02-25	张大良将“拔尖计划”的人才培养模式总结为“一制三化”，即导师制，小班化、国际化、个性化。“导师们指导学生规划学业、课外阅读与科学研究，推进学生的综合能力培养、创新科研训练；小班化教学注重启发式、探究式、研究式学习方法；个性化鼓励学生以兴趣为导向自主选择导师、课程，开展科研训练，进行学术探索；国际化不仅注重引进国际大师，还将学生交换到国外交流学习。总的来看，这样的培养让‘拔尖计划’学生在批判性思维、整合能力、相互协作能力上表现突出，这样的培养也真正培养出了一批有热情，以崇尚科学、追求学术为人生理想的优秀学生。”他介绍说。
2	不适应”给教育改革添动力 2013-04-10	虽然当下的教育改革一再强调要加大创新教育、想象力发展、批判性思维，乃至社会化教育构成、个性思维等，可看看我们的实际教学，题海战术、模式化训练仍然是诸多学校提高升学率的“法宝”。要想上名校，必须接受流水线一样的考试训练，学生们成了背诵、记忆的“教育容器”，而不是学习上的创造者、探索者;社会化思维、批判性思维、自主性创新意识明显不足，视野狭窄，最终必然出现各种“不适应”。
3	不适应”给教育改革添动力 2013-04-10	为了让孩子得到更为深入、深度的创造性发展，我们应该对学校教育、家庭教育乃至课堂模式、评级制度等，进行深入反思和纠正，少一些题海战术、圈养思维，多强化社会化发展思维、开拓性发展思维，以及独立性、批判性思维。
4	“三三制”拔尖人才培养模式改革与探索 2014-04-04	高年级研讨课面向全校二、三年级本科生开设，定位于“三层次批判性思维训练课程体系”中第三层次学科前沿课程，是学生继新生研讨课和通识教育课学习后，进一步加强批判性思维训练的重要阶段。高年级研讨课的授课教师须兼备较高的研究性教学水平和较好的科研能力，通过研究性、探究式、互动式的教学，使学生深化对某一学科专业领域的认识，进一步激发其探索与研究的兴趣，启发科学思维，提高实践与创新能力。。

5	创新人才培养模式全面提高人才培养质量 2012-03-21	2003 年西安交通大学开始探索“2+4+X”人才培养模式改革。“2+4+X”是基于通识教育和创新能力培养的研究型大学人才培养新模式...2011 年在“2+4+X”中，开设了“自然科学与技术、文化传承、社会与艺术、生命与环境、世界文明”五大类核心课程，向大学生展现一个全新的对社会、对文明、对人类自身的认识，培养学生的批判性思维和独立思考能力，为他们带来更宽阔、更深层次的思考。
6	创新型学术人才培养的改革与实践 2014-04-04	计算机科学实验班创新启发式教学，强化学生讨论、课堂互动和深度思维训练，结合项目训练激发学生好奇心、想象力和批判性思维，培养学生表达能力、发现问题能力和学术判断力，让学生每节课都面临挑战并有收获。
7	杜玉波同志在创新高校人才培养座谈会上的讲话 2014-04-04	以“拔尖计划”带动本科教育质量整体提升。“拔尖计划”不仅吸引了一批有热情、有创新潜质的优秀学生树立起崇尚科学、追求学术为人生理想，更激发了高校教师培养创新人才的热情，带动了高校各学科专业全方位创新人才培养改革。拔尖学生普遍展现出既有远大理想又脚踏实地的精神风貌，在批判性思维能力、知识整合能力、相互协作能力等方面表现突出
8	对培养一流拔尖创新人才的思考 2012-10-10	由于缺乏“独立之精神、自由之思想”，缺乏批判性思维，反映在科研上，我们缺乏足够的自信心去做原创性的研究。国内一流的科学家比较多地跟着别人做，而不是开辟新的领域让别人跟着做。我们过分重视国外“权威学者”的意见，顶礼膜拜所谓的“权威刊物”。
9	对培养一流拔尖创新人才的思考	创新型杰出人才有多种内禀特性，对于中国学生而言，最缺乏的特性有好奇心、想象力和批判性思维。

	2012-10-10	
10	多元化手段 个性化发展 2012-03-21	第三层次的学科前沿课程旨在帮助学生认识学术新领域、新发现、新方法，能够自主提出问题、分析问题和解决问题。课程改革以来，师生均反映相较传统课程，批判性思维训练课程更有利于激发学生的学习兴趣（快乐学习），提升学生的学习能力（主动学习）。
11	多元化手段 个性化发展 2012-03-21	本学期，学校启动了全新的高年级研讨课申报工作。高年级研讨课面向全校二、三年级本科生开设，定位于“三层次批判性思维训练课程体系”中第三层次学科前沿课程，是学生继新生研讨课和通识教育课学习后，进一步加强批判性思维训练的重要阶段。高年级研讨课的授课教师须兼备较高的研究性教学水平和较好的科研能力，通过研究性、探究式、互动式的教学，使学生深化对某一学科专业领域的认识，进一步激发其探索与研究的兴趣，启发科学思维，提高实践与创新能力。
12	改革创新 培养卓越医生 2014-03-13	以教师为中心的教学方法，...培养出来的学生，总体而言，追随教材，追随现成知识和既有答案，习惯依从和遵循权威，发散性思维、批判性思维训练不足，创造性较差。相应流行的学术文化往往是以学生接受、遵从老师和权威观点为要。在知识创新傲立国力竞争的现时代，在人类医疗和健康问题层出不穷的现时代，这种教学方式对医学生创新力的制约是明显的。
13	改革人才培养体制 2010-09-15	当前，我国教育体制存在的核心问题是人的主动性、积极性、创造性没有得到充分的发挥、激励和保护。主要表现为：...教育教学质量不断提升，但教学内容繁、难、偏、旧，教学方法过分依赖书本、课堂、教师讲授，对非考试科目重视不够，反映时代要求的核心内容不够，对学生创造性思维、批判性思维的培养不足；
14	高校怎样提高教育	南大着力打造新生研讨课、通识教育课和学科前沿课等新型课程，形成三层次批判性思维训练课程体系。...学科前沿课程帮助

	质量 2012-03-26	学生认识学术新领域、新发现、新方法，自主提出问题、分析问题和解决问题。
15	高校自主选拔录取改革试点工作会议交流发言汇编 2013-03-31	为使更多学科特长突出、具备创新潜质的优秀学生脱颖而出，我们在评价标准和考试形式上进行了较大的改革。...根据北大人才培养特色和需求，结合学生的学业成绩及在校表现等过程性评价，把考查重点转向对学生长远发展更为重要的潜能、兴趣、理想抱负、想象力、逻辑思考与批判性思维、领导力、社会责任感等要素上来，为各类具有不同特点和创新潜质的优秀人才脱颖而出创造条件，努力为北京大学建成世界上最好的本科教育奠定基础。
16	各国教育改革的共同特点是加强学生综合素质培养 2009-01-10	首先是批判性思维，对一个问题不能被动地接受知识，要批判地思维；二是要有创新能力，要独立判断、独立思考，不是简单地重复所学的知识；
17	华东师范大学实施研究生创新能力提升计划有效推进研究生教育创新发展 2009-07-03	对学校文科研究生增设数字文献检索、常用统计方法等应用性课程，全面提升学校研究生科研创新能力,在授课方式上，积极推进教学改革，提倡讨论式、互动式、案例式教学，注重训练并培养研究生自主获取知识、发现问题、形成批判性思维进而发展知识的能力。
18	华中科技大学设实验区培养	学校为启明学院创新人才培养建立了一系列新机制。如...注重学生领导能力、主动实践能力、人际沟通能力、团队合作能力、获取信息能力和批判性思维能力的评价；建立荣誉资格制度和优补

	拔尖创新人才 2009-05-05	与退出的竞争机制。
19	集全校之力 办中国最好的本科教育 2012-03-22	为了提高学生的批判性思维能力、激发创造力潜质，我校动员高水平教师，着力打造新生研讨课、通识教育课和学科前沿课等新型课程，形成三层次批判性思维训练课程体系。
20	集全校之力 办中国最好的本科教育 2012-03-22	新生研讨课程针对本科一年级新生开设，由知名教授主讲，旨在帮助新生树立学术旨趣，学会质疑、学会发现，完成学习性转换和适应性转换。通识教育课程旨在开阔学生学术视野，培养文化通感和科学精神，促进形成独立的人格和价值观。学科前沿课程旨在帮助学生认识学术新领域、新发现、新方法，能够自主提出问题、分析问题和解决问题。
21	加大试点改革力度 为天下英才成就梦想 2014-04-04	以“思源致远”为精神追求，以“创新型领袖人才”为培养目标，上海交通大学成立了以校长兼任院长的致远学院，作为“基础学科拔尖学生培养试验计划”的基地，集全校之力，致力于培养具有批判性思维能力、知识整合能力、沟通协作能力、多元文化理解能力和全球化视野的创新型科技领袖人才。
22	加大试点改革力度 为天下英才成就梦想 2014-04-04	注重小班研讨和思维训练。为实现培养创新型领袖人才的使命，致远学院采取小班研讨式教学和鼓励学生参与科研等措施，培养学生的逻辑思维能力、整体思维能力、批判性思维能力、创造性思维能力、整合知识、相互协作和沟通表达能力，以及多元文化理解和全球化视野。
23	加快建设	二要转变教育观念。要抓住学习贯彻教育规划纲要的契机，开展

	中国特色现代高等教育 努力实现高等教育的历史性跨越 2010-08-23	教育观念和教学工作大讨论，进一步更新观念，拓宽思路。在人才培养中，要更加注重创新性，改变死记硬背的学习方式，增强学生的创新精神和创新能力，培养跨学科思维和批判性思维；
24	坚持科学发展 奋力改革创新 2012-08-23	学校必须把长期积累的各方面优势转化为提高人才培养质量的新优势，促使拔尖创新人才脱颖而出，必须持续深化教育教学改革，构建创新教育体系，注重培养学生的创新精神和批判性思维，鼓励多样化成长，努力为通才拓宽通道、为天才开辟空间。
25	建立质量保障体系 提高卓越法律人才培养质量 2013-07-02	专业素养要求学生具备扎实的法学知识、法律实务工作技能、较强的法律思维能力和法学研究能力、创造性思维、批判性思维和独立判断的能力。职业素养要求学生具有正确的人生观、价值观、复合型知识结构和良好的法律职业道德。
26	江苏省委书记南京大学作形势报告鼓舞全校师生 2011-05-07	“进一步创新办学理念、教学方式和人才培养模式，增强学生的创新意识和创业能力，为江苏‘两个率先’输送更多的创新创业人才”，是罗志军对南大的第三点希望。南京大学副校长谈哲敏认为，培养人才是大学的根本，2009 年以来南大对本科人才的培养进行了改革，实施了“三三制”培养方案，着重加强本科生的通识教育和批判性思维的培养，对增强学生的创新意识和创业能力产生了非常积极的效果。
27	教育部 卫生部关于加强医学教育工作	建立以学生为中心的自主学习模式，确立学生在教学中的主体地位，着力推进教学方法的改革与实践，加强学生终身学习能力、批判性思维能力和创新能力的培养。

	提高医学教育质量的若干意见 2009-02-20	
28	教育部 卫生部关于加强医学教育工作提高医学教育质量的若干意见 2009-02-20	必须为教师提供基本的科学研究条件，营造浓厚的学术氛围，提倡创新和批判性思维，促进教学与科研相结合。
29	教育部关于改进和加强研究生课程建设的意见 2014-12-05	坚持服务需求、深化改革、立德树人，以研究生成长成才为中心，以打好知识基础、加强能力培养、有利长远发展为目标，尊重和激发研究生兴趣，注重培育独立思考能力和批判性思维，全面提升创新能力和发展能力。
30	教育创新的硕果,群体智慧的结晶 2012-11-05	。我们与各国教育相比，我国学生掌握基本知识和基本技能并不差。缺点是我们的学生缺乏创新思维、批判性思维;
31	介绍全国教育工作	人民日报：缺少创新思维和批判性思维的教育，现在已经成为培养拔尖创新人才的瓶颈，比如在大学里，现在很多大学的课程还

	会议召开半年多来高等学校拔尖创新人才培养工作有关情况 2011-02-25	是以为讲座式的课程为主，小组讨论的挺少的，导致学生不敢提问，不善提问。我想请教各位老师，在这方面有没有什么新的想法和做法，我看了南京大学的三三制，很受启发，但是没有在培养批判性思维、创新思维这方面看到更多介绍，请陈处长多给介绍一下。
32	九三学社上海高校八基层第39次联席会议在复旦大学举行 2008-06-18	高校课堂教学基本上仍实行以教师为中心的大班授课制，教师讲授、学生记笔记、定期考试的方式。许多教师采用照本宣科的注入式教学方法，教学方法上还未有效地突出能力的培养，缺乏协作学习和团队精神的培养。理论课为主，实验课不仅课时少，而且往往难以保证实验的质量。这在一定程度上影响了学生实践能力、创新能力和批判性思维能力的发展。
33	南京大学凝心聚力着力提高本科人才培养质量 2012-04-09	动员高水平教师，采用研究性、研讨式教学方法着力打造新生研讨课、通识教育课和学科前沿课等新型课程，形成三层次批判性思维训练课程体系，着力提高学生的批判性思维能力，激发创造力潜质。鼓励、引导名师上讲台，新生研讨课和通识教育课95%的课程主讲人为院士、长江学者、国家级教学名师、知名教授、学科带头人。
34	破解难题着力提高人才培养质量 2012-03-21	通识核心课程注重培养学生的批判性、创造性、系统性、预见性的思考能力，使学生具备较强的写作与沟通能力。在课程的考核上，要求以创造性、批判性思维为主，开放性题目为主的考试和高要求的作业或当场练习相结合的考核办法。
35	人才培养	这就需要高校转变过去“轻教学、重科研”以及“轻育人、重学科”

	水平是衡量高教质量的首要标准 2012-03-26	的观念，牢固确立人才培养在高校工作中的中心地位，牢固树立全面发展观念、人人成才观念、多样化人才观念、终身学习观念和系统培养观念；同时，要求高校要以“厚基础、宽领域、强能力、高素质”为人才培养目标，注重培养学生的批判性思维和跨学科思维以及解决实际问题的能力，积极营造鼓励独立思考、自由探索、勇于创新的良好环境，培育学生的国际视野和尊重多元文化的博大胸怀。
36	上海交通大学三项举措建设创新人才培养“特区” 2010-10-18	一是培养学生提出和分析问题的能力。学院每年利用 3 周左右时间开设暑期研讨课程，邀请杰出教授为大一学生开设短期课程，开阔学生视野，拓展学生思维，培养学生的科学素养和科研兴趣。二是培养学生的创新意识和批判性思维，以及知识整合能力和沟通能力。学院通过研讨课、报告会等方式，把能力培养贯穿教学全过程。作为教学特色之一，学院每学期都开设 2 学分由杰出教授主持的讨论课程。交大校长张杰院士以及一批海内外杰出教授都在讨论课上与学生交流。三是利用各种机会让学生近距离聆听国际学术大师的教诲。
37	深化高等教育改革走以提高质量为核心的内涵式发展道路 2012-05-16	要确立学生在学习中的主体地位，逐步改变以教师为中心的知识传授型教学方式，开设由学生和教师共同选题的自主学习课程，构建多元学习模式，加强学习策略和方法的训练指导，培养学生的批判性思维和创新能力，促进个性发展。
38	始终坚持教育以人为本 全面服务学生学习成长 2012-03-	学院实施自主制订学习计划、自主选择专业、特别学分制、专业导师制、创新性实验计划、优补与退出等创新人才培养制度。...制定以能力评价为主的学生学业评价体系，教师评价与学生评价相结合，形成性评价与终结性评价相结合，注重学生领导能力、自主学习能力、主动实践能力、人际沟通能力、团队合作能力、

	21	获取信息能力和批判性思维能力的评价；建立优补与退出的竞争机制。
39	拓宽学生个性化成才通道 2013-05-01	由于应试教育的长期影响，学生习惯于接受知识的灌输，相信书本、相信经验、相信标准答案，普遍缺乏深入探究和独立思考的能力。批判性思维训练的缺失已成为制约拔尖创新人才培养的“瓶颈”。
40	拓宽学生个性化成才通道 2013-05-01	针对这一问题，南大着力建设由新生研讨课、通识教育课和学科前沿课所构成的“三层次批判性思维训练体系”。...这些新型课程广泛采用研究性教学方法，以问题求解、交互式学习、研讨式学习等新的教学形式进行教学，有效地激发了学生的创新潜质，引导一线教师不断审视和创新教学方法，促进教学和科研的深度融合。
41	拓宽学生个性化成才通道 2013-05-01	新的人才培养方案强调培养学生的批判性思维和创新能力，强调拓展交叉知识领域。
42	网友高校和高职高专国家级精品课程评估中存在的问题 2008-10-06	教师只有结合自己的专业特长进行有针对性的科学研究，及时借鉴吸纳最新科研成果，把教学内容中的静态（教材）与动态（新的科学研究成果）结合起来，拓展教学的深度和广度，提高教学的品位，才能不断地丰富课程的学术内涵和教学内容，从而在教学当中更好地激发学生的创新思维和批判性思维，培养学生严谨治学和不畏艰险的工作精神，稳妥有效地提高教学质量。
43	新一轮高考改革究竟改了什么 2014-09-	因此，除高考分数之外，诸如价值观、创新精神、批判性思维、实践能力、社会责任感等对人的成长成才至关重要的综合素质，都可以进入大学招生录取的环节，并可能成为更加重要的录取依据。

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44	研究型大学本科教育 质量战略与管理特色探讨 2007-03-09	一是建设以通识为基础的培养模式，利用学科综合优势培养基础扎实、博学多才的本科生，使他们获取持续发展和厚积薄发的能力，使他们成为具有多学科知识背景和多视界思维模式的创新人才；二是建设以探究为特征的教学模式，促进教学与科研互动，促进教师与学生互动，注重培养学生严谨的思辨能力和批判性思维方式；三是建设以能力为取向的实践模式，通过加强实践教育和创业教育，着力培养学生的“三创”精神和实践能力；四是建设以人格为核心的育人模式，重视培养大学生健全的人格，致力于人的全面发展。
45	浙江大学全方位开展本科生培养体制改革 2013-02-18	课程定位方面强调学习经典与前沿知识，培养批判性和创造性思维;课程教学模式方面采用大班理论授课和小班课堂研讨相结合的方式;课程的考核方面，要求以创造性、批判性思维为主，开放性题目为主的考试和高要求、大容量的作业或当场练习、现场演讲相结合的考核办法。
46	郑南宁我们从钱学森那里学到什么 2011-12-08	现在大学培养的大多数学生与过去相比在许多方面都有长足进步，但我们在人才培养中仍然存在不可忽视的问题，特别是学生在独立思考、批判性思维、数理能力、艺术修养和道德判断等方面的能力未达到所期望的水平。而这些方面的教育是培养全面发展的创新型人才的基础。

1.28 CT and world-class education

	Title and time	Paragraph surrounding CT
1	不适应”给教育改革添动力	在一次考试中落选不是大问题，未来在国际竞争、人才竞争中被淘汰，才让人揪心。上述“不适应”，应当成为教育改革的动力。为了让孩子得到更为深入、深度的创造性发展，我们应该对学校

	2013-04-10	教育、家庭教育乃至课堂模式、评级制度等，进行深入反思和纠正，少一些题海战术、圈养思维，多强化社会化发展思维、开拓性发展思维，以及独立性、批判性思维。
2	杜玉波同志在创新高校人才培养座谈会上的讲话 2014-04-04	拔尖学生普遍展现出既有远大理想又脚踏实地的精神风貌，在批判性思维能力、知识整合能力、相互协作能力等方面表现突出，部分学生已在学术领域崭露头角，在世界顶尖学术期刊上发表论文，在国际大赛上表现优异。
3	对培养一流拔尖创新人才的思考 2012-10-10	出世界一流物理学家应该是中国一流大学物理系的历史使命。我们工作的关键是要创造一个好的环境以利他们将来成才。对于杰出人才的培养，我们特别要重视对学生的批判性思维、想象力和好奇心的培养。
4	改革创新培养卓越医生 2014-03-13	以教师为中心的教学方法，不见得学生没有学习积极性，不见得学生不刻苦学习，但培养出来的学生，总体而言，追随教材，追随现成知识和既有答案，习惯依从和遵循权威，发散性思维、批判性思维训练不足，创造性较差。相应流行的学术文化往往是以学生接受、遵从老师和权威观点为要。在知识创新傲立国力竞争的现时代，在人类医疗和健康问题层出不穷的现时代，这种教学方式对医学生创新力的制约是明显的。
5	高校自主选拔录取改革试点工作会议交流发言汇编 2013-03-	把考查重点转向对学生长远发展更为重要的潜能、兴趣、理想抱负、想象力、逻辑思考与批判性思维、领导力、社会责任感等要素上来，为各类具有不同特点和创新潜质的优秀人才脱颖而出创造条件，努力为北京大学建成世界上最好的本科教育奠定基础。

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6	构筑大类培养和自由转专业的成才通道 2015-02-16	据加州大学伯克利分校“全球研究型大学本科生学习经历调查”显示，南大学生“学术思维和表达能力”进步程度，经历“三三制”者显著优于未经历者；学生批判性思维能力等进步程度与伯克利无显著差异。
7	加大试点改革力度 为天下英才成就梦想 2014-04-04	注重小班研讨和思维训练。为实现培养创新型领袖人才的使命，致远学院采取小班研讨式教学和鼓励学生参与科研等措施，培养学生的逻辑思维能力、整体思维能力、批判性思维能力、创造性思维能力、整合知识、相互协作和沟通表达能力，以及多元文化理解和全球化视野。...大三开始学院举行系列暑期班及鼓励学生参加国外一流大学的暑期班；
8	加快建设中国特色现代高等教育 努力实现高等教育的历史性跨越 2010-08-23	二要转变教育观念。要抓住学习贯彻教育规划纲要的契机，开展教育观念和教学工作大讨论，进一步更新观念，拓宽思路。在人才培养中，...注重开放性，改变比较封闭的培养方式，培育学生的国际视野和尊重多元文化的博大胸怀；
9	坚持科学发展 奋力改革创新 2012-08-23	人才培养是学校的根本任务。清华大学校长陈吉宁认为，在探索“中国特色、世界一流”的发展道路上，清华大学致力于造就治学、兴业、治国的英才。因此，学校必须把长期积累的各方面优势转化为提高人才培养质量的新优势，促使拔尖创新人才脱颖而出，必须持续深化教育教学改革，构建创新教育体系，注重培养学生的创新精神和批判性思维，鼓励多样化成长，努力为通才拓宽通道、为天才开辟空间。

10	建立质量保障体系提高卓越法律人才培养质量 2013-07-02	适应社会经济发展需求，结合上海地域特点，发挥学校优势特色，根据卓越法律人才的培养目标，重点培养学生基本素质、国际视野、批判性思维、实践能力等，学校建立了符合质量要求的课程教学体系，在常规的课程结构下，调整课程结构，增加课程模块，改进教学方法，提高教学质量。
11	教育创新的硕果,群体智慧的结晶 2012-11-05	人才培养体制的改革是教育改革创新的核心，一切为了多出人才，出好人才。大家都在讨论钱学森之问，要破解这个问题，固然需要各方面的努力，但人才培养模式的转变是最重要的一环。我们与各国教育相比，我国学生掌握基本知识和基本技能并不差。缺点是我们的学生缺乏创新思维、批判性思维;
12	人才培养水平是衡量高教质量的首要标准 2012-03-26	当前，提高人才培养水平，关键在于高校要切实转变教育教学观念，不断深化教育教学改革。...要求高校要以“厚基础、宽领域、强能力、高素质”为人才培养目标，注重培养学生的批判性思维和跨学科思维以及解决实际问题的能力，积极营造鼓励独立思考、自由探索、勇于创新的良好环境，培育学生的国际视野和尊重多元文化的博大胸怀。
13	上海交通大学三项举措建设创新人才培养“特区” 2010-10-18	一是培养学生提出和分析问题的能力。...二是培养学生的创新意识和批判性思维，...三是利用各种机会让学生近距离聆听国际学术大师的教诲。诺贝尔物理学奖得主戴维?格罗斯教授来交大访问期间，单独与数理科学班的同学进行座谈，对同学们的综合科学能力给予高度肯定。四是实行全面导师制。学院邀请一批活跃在国际学术前沿的学者来校访问，为低年级学生开设研讨课程，为高年级学生指导科研项目，全面地培养学生的科学素养和科研实践能力。同时，鼓励并推荐学生到耶鲁大学等一流大学实验室进行科学研究。
14	“拔尖计划”未来	张大良将“拔尖计划”的人才培养模式总结为“一制三化”，即导师制，小班化、国际化、个性化。“...这样的培养让‘拔尖计划’学生

	国际一流科学家的摇篮 2014-02-25	在批判性思维、整合能力、相互协作能力上表现突出，这样的培养也真正培养出了一批有热情，以崇尚科学、追求学术为人生理想的优秀学生。”他介绍说。

1.29 CT and learning from Western HE systems

	Title and time	Paragraph surrounding CT
1	2006 密西根—中国大学领导论坛一年后的评估报告(参考译文) 2007-07-11	在密西根论坛中，来自密西根大学的演讲者们广泛运用了生动的教学方法来建立优秀的教学模式，并展示如何促进学生的批判性思维。作为结果，很多大学领导表示他们已经亲身加入改善学校教学的行动之中。
2	大学理念再思考 2007-02-06	作为现代大学教学体系基础的是知识的分类与学科的分化。...哲学就其最初的含义而言，意味着“critical thinking”（批判性思维）。这种批判性思维既包括对外部世界与人类社会本源、性质以及运行方式进行思考，也包括对社会与政治的道德目标进行思考。对自然界思考的结果是现代自然科学的兴起，最初的许多自然科学成就都是在哲学学科范畴内实现的，许多重要的自然科学家当时都是哲学学院的教授。...当然社会科学各学科的相继独立是 19 世纪后半期以后的事情。以法国实证主义哲学家孔德为代表的实证主义成为推动社会科学各学科兴起的直接动力。...这样，自 19 世纪以来，社会科学逐步从哲学中分离，形成历史学、经济学、政治学、社会学、人类学五个基本学科。
3	法国高等教育大众	教科文组织的资深高等教育顾问 Chitoran 认为，要用不同的质量标准去评估不同层次、不同类型学校的教育质量。不同院校的水

	化的历程 2006-05-25	平差异，并不代表质量差异，原则是，学校应培养合格的毕业生。此外，专业知识和技能并不比批判性思维能力更重要，对思维能力的评估更难操作。而该组织高等教育处质量科科长 S.Uvalic-Trumbic 女士则更重视大众化和跨国教育背景下，如何进行文凭互认，如何通过 ICT 评估跨国教育质量。
4	各国教育改革的共同特点是加强学生综合素质培养 2009-01-10	首先是批判性思维，对一个问题不能被动地接受知识，要批判地思维；二是要有创新能力，要独立判断、独立思考，不是简单地重复所学的知识；三是分析和解决问题的能力；四是终身学习的能力；五是团队工作的合作能力；六是自我管理和学习能力。
5	加拿大关于多伦多领区大学医学教育情况的报告 2006-05-25	在不断加强医学教学改革的同时，不断整合国外医学教学改革成果。在培养目标及课程设置、教学方法上体现以人为本的精神，特别注重培养学生的批判性思维和终身学习的能力。
6	美国研究型大学本科教育改革简介 2006-05-26	研究型大学是一个研究者、学习者的社区，在这个大社区中又有各种以共同的兴趣或需要为基础形成的小社区。社区中的人际交往构成了社区生活，比如学生活动、社会聚会、文化事件等。它们都有潜在的教育功能，是发展交流技能和批判性思维能力的途径，是提供多元文化和智力经验的场所。
7	面向二十一世纪高等教育宣言：观念	第五条 教育方式的革新：批判性思维和创造性

	与行动（草案）2004-07-10	
8	首届耶鲁—中国大学领导高级研讨班总结报告 2005-06-09	耶鲁宣称如何想比想什么更重要。强调培养学生的聪明才智而不以专门的职业准备为目的，尤其强调培养学生独立的批判性思维能力。

Appendices of chapter 6

2.1 Posts asking about selecting CT modules

	Time of the posts	Quotes from the texts (translation)
1	2014-02-20	有人选过逻辑与批判性思维吗。。， (Has anyone selected the Logic and CT module?)
2	2014-02-26	Re-tweet the post above
3	2014-02-26	
4	2014-02-25	
5	2014-02-18	有谁知道逻辑学与批判性思维导论这课是怎么回事吗，非选不可？ (Does anyone knows what is this Logic and CT module? Is it compulsory?)
6	2014-02-25	Re-tweet the post above
7	2014-02-25	
8	2014-02-15	求问逻辑与批判性思维这课咋样烧香烧香 (How is this Logic and CT module, please please answer me)

9	2013-12-23	逻辑学与批判性思维概论,求问这课如何 (Introduction to Logic and CT, please tell me how this module is)
10	2013-12-24	Re-tweet the post above
11	2013-12-16	逻辑学与批判性思维概论这门课怎么样？？--------通过微信发布 XXX (How is this Logic and CT module??---posted through XXX's WeChat)
12	2013-12-16	Re-tweet the post above
13	2013-12-16	
14	2014-01-21	：#试一试万能的人人# 有学长学姐上过"逻辑与批判性思维"这门通选课吗，求评价……（3学分的课不敢贸然选囧-窘迫囧-窘迫囧-窘迫） (#try the useful Renren# Has any senior students studied this module "Logic and CT", please give some comments....(this is a three credits module I dare not to select it hastily-embarrassed-embarrassed-embarrassed)
15	2014-03-06	求问逻辑与批判性思维怎么样啊 会不会挂 (Please tell me how is this Logic and CT module. Will some people fail to pass in this module?)
16	2014-02-27	有谁知道批判性思维这课怎么样？老师让四人组队，会有展示么？还是作业？会点名么？给分怎么样呀？求知情人士指点！ (Does anyone knows how is this CT module? The teacher asked students to form four-people-teams. Does that mean there

		will be presentations? Or assignments? Will the teacher ask us to sign in in each class? Will the teacher give high marks? Please someone knows these tell me.)
17	2014-02-26	：“学术英语专项技能--批判性思维”这课有人上过么 0-0 求评价 0-0 (Has someone took this module “Academic English Skills--CT”? Please give some comments.)
18	2014-03-04	我怎么觉得一些理工类专业应该开设人文社科通识教育、大学写作、逻辑、辩论、批判性思维之类的课程呢？方舟子还是理科生呢。 (Isn’t it right to think that universities should offer social science and liberal arts modules, writing, logic, debating and CT modules for students of science subjects? Fang Zhouzi, a well-known Chinese critical thinker, was also a student of science subject.)
19	2011-01-23	分享日志 心仪的通选课~~~GGJJDDMM 进来给点意见哈 ）逻辑导论逻辑与批判性思维西方思想经典(一)（XXX）西方哲学导论（XXX）哲学导... (These are the elective modules I’m interested in. Please give me some comments: Introduction to Logic and CT; Classics of Western Thinking; Introduction to Western Philosophy; Introduction to Philosophy...

20	2014-01-13	求推荐一门 C 类通选：《四书》精读 爱的心理学 逻辑与批判性思维 社会心理学 心理学概论 哲学导论 中国佛教史 宗教学导论 (Please suggest a selective module of C type for me: Intensive Reading of the Four Books; Psychology of Love; Logic and CT; Social Psychology; Introduction to Sociology; Introduction to Philosophy; The History of Chinese Buddhism; Introduction to Religion.)

2.2 Posts looking for classmates or teammates in CT classes

	Time of the posts	Quotes from the texts
1	2014-04-04	有没有人也报了周四晚上的批判性思维与写作。。求队友出现 (Is there anyone who had also selected the CT and Writing module in Thursday evening..I'm looking for teammates.)
2	2014-04-03	QQ群XXX招管理员。学习批判性思维,知识论。1有逻辑基础，有科学哲学背景，有较为成熟的知识论。2积极的学习批判性思维。有足够精力热情组织、参与群里的活动。3专业与逻辑相关的人优先。求扩散。 (Looking for administrators for our QQ group. We need those who had studied CT and theories of knowledge. 1. Has background of logic, philosophy of science, and mature in theories of knowledge. 2. Actively study CT and have enough enthusiasm to participant in this group. 3.

		Those whose subjects are related to logic is preferred. Please re-tweet.)
3	2014-04-03	Re-tweet the post above
4	2014-04-03	
5	2014-04-04	
6	2014-04-08	
7	2014-04-02	有没有同学在上周一下午第二节的社会学理论与历史以及周二晚上的逻辑与批判性思维的？有事求问～ (Is there any schoolmate who takes the Theories of Sociology module in Monday afternoon and the Logic and CT module in Tuesday evening? I want to ask something~)
8	2014-03-01	转自XXX : 谁选了周五下午的批判性思维！！！急求 (Who has selected the CT module in Friday afternoon? Please tell me quickly.)
9	2014-02-28	有谁选了周五下午的批判性思维吗 (Has anyone selected the CT module in Friday afternoon?)
10	2014-02-26	求问 有没有这学期修中心的周三晚上的批判性思维的 童鞋啊 （求扩散） (Is there anyone who has selected CT module in Wednesday afternoon? Please re-tweet this post)
11	2014-02-26	Re-tweet the post above
12	2013-12-07	寻找有缘人：有木有人像我一样选了尔

		雅视频公开课的“逻辑和批判性思维”，给我私信或留言，咱们多多交流哦。(Looking for teammates. Is there anyone who also has selected the online module of CT? Please contact me. Let’s communicate more.)
13	2013-12-20	Re-tweet the post above
14	2013-12-20	
15	2013-12-02	求转 XXX: 小伙伴们帮帮忙：求选了江安周二晚上B306【逻辑与批判性思维】课程的童鞋一枚，求联系。(Looking for classmates in the Logic and CT module in Tuesday afternoon. Please contact me.)
16	2013-10-10	有没有上周四二大节的批判性思维的同学？急求伙伴……Is there anyone who also took the CT module last Thursday? Needing a teammate very much.

2.3 Posts showing interests in CT modules

	Time of the post	Quotes from the texts
1	2014-01-08	求换课，我选了周四晚上9-10节的跨文化交际英语课程，想换成周四晚9-10节批判性思维，这两个都是大学英语高级课程。。哪位亲可以换个课(I selected the module of Cross-cultural Communication English. I want to change it to the CT module. Can anyone exchange with me?)

2	2014-01-10	Re-tweet the post above
3	2013-12-24	帮扩 转自XXX : 马上就要抢课了，有没有童鞋想要周三的中国哲学智慧，我只求周四六大的批判性思维 We are going to select modules soon. Is there anyone who wants to take the Chinese Philosophy Wisdom module? I only want to take the CT module.
4	2013-12-24	Re-tweet the post above
5	2013-12-25	
6	2013-12-27	
7	2013-12-26	
8	2013-12-26	
9	2013-12-26	
10	2013-12-19	不想大四还上课，跪求一节周四晚上的批判性思维。用刑诉案例和劳动法换。 (I do not want to take modules in my fourth year. Please someone gives me the CT module. I'm willing to give you the Criminal Lawsuit module and the Labor Law module in exchange.)
11	2013-12-19	Re-tweet the post above
12	2013-12-19	
13	2013-12-19	
14	2013-12-19	

15	2013-12-19	
16	2014-06-26	耶！我放心了 选上了逻辑与批判性思维 (Good! I'm relaxed. I got the Logic and CT module.)
17	2010-12-24	好羡慕10级的啊！你们的通识课比我们的不知好了多少倍！！2010-2011学年春季学期开设通识主干课程简介《批判性思维》...万分想修这门课，求哪位时间上没有刚性要求的同学帮忙换个时间~请吃饭，因为我只有专业课。。。 (I really envy the students who were enrolled in 2010. Their modules are much better then ours. The liberal art module of CT. I want to take this module very much. Is there anyone wants to exchange with me? I will treat you a meal, because I only have modules of my subject.)
18	2011-01-21	Re-tweet the post above
19	2011-01-20	
20	2011-01-13	
21	2011-01-11	
22	2011-01-10	

2.4 Posts saying CT modules are very hard

	Time of the post	Quotes from the texts
1	2014-03-06	批判性思维好高！大！上！你该来听听@XXX 嗯，忘了说了，它还可以叫逻导2.0 (CT is very high, big and superior! You should come and listen @XXX Forget to

		mention, it can also be called the Introduction to Logic Level Two.)
2	2014-03-06	Re-tweet the post above
3	2014-03-07	
4	2014-04-15	智商已成为上“逻辑与批判性思维”的瓶颈的瓶颈生病 (Intelligence quotient has become the choke point or bottleneck of taking the Logic and CT module.)
5	2014-03-26	批判性思维，这课对我来说，有！点！难！ CT. For me, this module is a bit hard!
6	2014-03-30	Re-tweet the post above
7	2014-03-13	一节批判性思维课再次让我认识到了思维回路间的鸿沟... (A CT module again let me see the gap of my thinking.)
8	2014-03-15	Re-tweet the post above
9	2014-03-15	
10	2014-03-15	
11	2013-12-25	有没有人上过 逻辑与批判性思维？。。这门课的ppt里面的内容简直是……让我感到智商是负数...数分顶多让我明白IQ不大于0 (Has anyone taken the Logic and CT module? Seeing the content of the lecture slides, I felt my IQ is below zero. It let me know this at least.)

12	2013-12-24	不怕死你就来选批判性思维。 (If you are not afraid of death, you can select the CT module.)
13	2015-03-29	写了一晚上批判性思维课的作业，累趴，难掩心中不悦在作业中把这门课黑了。 (I have written CT assignment for the whole night. I'm too tired. I cannot ignore my unhappiness so it is reflected in my assignment.)
14	2014-05-10	逻辑学与批判性思维要写逻辑和专业之间关系的论文，让我为难了 (The Logic and CT module requires me to write an assignment about the relationship between logic and my subject. This makes me feel very difficult.)
15	2014-04-15	非形式逻辑与批判性思维的论文根本不会写嘛。。。 (I do not know how to write the paper for the Informal Logic and CT.)
16	2013-12-26	来看看批判性思维的萌神级大咖是如何把俺秒杀成渣渣的吧！转自华中科技大学 SNC 华中科技大学 SNC：【讲座速递惊叹号】又一波人文讲座来袭~~给力给力 ①1957 期 主讲人：熊明辉主题：批判性思维的论证技巧时间地点：... (Come and see how this brilliant critical thinker crush me. Transfer information about lectures from Huangzhong University of Science and Technology. Lecturer: Xiong Minghui. Theme: CT and Arguing Skills.)

17	2014-01-10	老师我最感动的是你教给我的考试之外的东西，记得哲学第一节课全班跟你辩论了整整45分钟关于上帝存不存在，听了各位神人近乎抬杠的辩驳你最后说，要想批评一件事，就要先了解ta。从此启蒙了我懵懂的批判性思维，老师你现在上课大概还是这么发人深省吧～(在淡淡的忧伤中和对@XXX 的调戏中)
18	2012-02-19	分享日志 考完批判 特地过来吐个槽 下午考完批判性思维，忍不住想吐一下槽。 最近和舍友苦逼的复习批判性思维，感觉整个学期学的东西还没有这三天学到的多，主要是前面无法系统的看到所有的流派观点。 复习着复习着各种情感就上来了，不仅仅是因为现在随便拿个案例出来，都习惯用至少四种主义至少八个代表人物的观点理论来分析，而是在于讨论的过程中无论你是同意还是反对，都习惯迅速的从对立的立场和对立的角度罗列一大堆理由来反驳，反过来也 是。。。。 但是，你要问我有什么观点…… 大家的观点就是我的观点，我的观点是一个综合的观点…… 恩，咦？ 怎么感觉越来越像一个整天满口“一方面，另一方面……凡事都要好的方面和坏的方面……”的不痛不痒尸位素餐的形象了……

2.5 Posts asking about credits and exams of CT modules

	Time of the post	Quotes from the texts
1	2014-03-06	这个点选到了人文课是怎么回事 求问逻辑与批判性思维怎么样啊 会不会挂 (How can I get a humanity and art module at this time. Please tell me how is this Logic and CT module. Will I fail to pass I take it?
2	2014-03-06	Re-tweet the post above
3	2014-02-27	有没有人上过批判性思维这个课啊？这个课期末给分怎么样？——通过微信号 XXX 发布 (Has anyone taken this CT module? How will we be assessed in the end of semester? Sent through XXX's WeChat.)
4	2014-02-27	Re-tweet the post above.
5	2014-02-28	
6	2014-01-24	感谢老师批判性思维给我 85 分，感谢同组的小伙伴们的共同努力 (Thank my teacher for giving my 85 marks. Thank my teammates for making efforts with me.)
7	2014-01-26	Re-tweet the post above
8	2013-12-30	批判性思维这种考试就特么应该开卷考 (I think modules such as CT should be tested by open-book exams. Damn it.)
9	2014-01-04	Re-tweet the post above
10	2014-01-04	
11	2014-01-11	
12	2014-01-08	
13	2013-12-18	我今天是怎么了。。。中饭开始停不住嘴。。。是因为批判性思维的分数只能靠次来疗伤了么。。。。。哭

		(What is happening to me. I cannot stop eating since lunch. Is it because my bad CT score so I can only comfort myself by eating?...crying.)
14	2013-12-16	想问一下，生态文明建设和逻辑学与批判性思维这两个课好不，怎么考试啊，给分高吗？--------通过微信发布XXX (Excuse me, are these two modules good?: Construction of Ecological Civilization; and Logic and CT---posted through XXX's WeChat)
15	2013-11-29	有谁知道批判性思维到底是考神马题型啥的的一无所知真是森森的忧桑 (Does anyone knows what will be tested in this CT module? Such as what kind of questions will there be? I do not know anything. That is really sad.)
16	2013-11-15	大家快来帮忙！周四上午的批判性思维，老师说哪部分有考题可以去背啊~~求扩散啊~~！！ (Please help me everyone! The CT module in Thursday morning. According to our teacher, which part of questions can we recite? Please re-tweet!)
17	2014-05-28	Re-tweet the post above.
18	2014-05-28	
19	2014-04-16	大家谁在上逻辑与批判性思维，求答案，微信XXX (Who is taking the Logic and CT module, please give me the answers of the questions through my WeChat XXX).
20	2013-12-23	哪位大大上过第二模块的《逻辑与批判

		性思维》，求 ppt 上的答案~ (Who has taken the Logic and CT module, please give me the answers of the questions on the lecture slides.)
21	2014-01-08	对于这个我们可以复习些什么 难过难过 大家不要忘记带辞典了！！转自 XXX 通知：由于 XXX 老师早上在四牌楼赶不回来 原定于明天下午两点开始的批判性思维训练考试改为三点开始 地点仍在教一 401！！！大家奔走相告！！！！ @XXX (For this exam what should we prepare. Sad sad. Don't forget to bring a dictionary!. Transfer a piece of information: The teacher cannot come back so the time of our exam will be put off from 2pm to 3pm. The place is the same. Please tell your classmates!)

2.6 Posts showing the writers' personal understanding of CT

2.6.1 Understand CT as logic and rationality

	Time of the post	Quotes from the texts
1	2012-05-05	批判性思维，在我看来，就是有逻辑性的思考过程，可以帮助我... (CT, in my opinion, is just a logical thinking process. It can help me.)
2	2013-01-10	批判性思维的核心能力是构造好的论证。论证，由逻辑推理，证据，结论组成。简单说就是相信一个想法要有道理。但是道理是符合逻辑，有实践经验确证或者是有可以观察的事物对象支持的。 (The core of CT is to build a good

		argument. An argument is built by logical reasoning, evidence, and conclusion. In brief, believing an idea needs reasons. But the reasons need to be logical and be supported by experience or observation.)
3	2012-09-23	这种理性精神的深处无时无刻不显露出辩证的批判性精神 (This spirit of rationality always reflects the dialectical CT.)
4	2013-01-03	Re-tweet the post above.
5	2014-04-03	
6	2014-01-05	听我爸妈吵架一听就知道肯定没有学习过批判性思考。。各种思维逻辑误区乱七八糟揉在一块儿真是捉鸡尴尬 (From the way my parents argue with each other, I know they had not learnt CT. They made various logical flaws.)
7	2014-07-01	Re-tweet the post above.
8	2013-11-29	批判性思维。。。是逻辑。。。啥 (CT is...logic...what)
9	2013-12-09	why we are called 学长？是拥有更 成熟的人生观、价值观，拥有更 深厚的学识、专业知识，拥有更 系统的独立的批判性思维、逻辑，否则，只能 be called 年长、、、 (why are we called the senior students? Because we have more mature value system and opinion of life, richer knowledge and more systematic and independent CT and logic. Otherwise, we are only senior in age.)

10	2013-12-04	做逻辑和批判性思维考的是头脑和_____? What do logic and CT is brain and...what?
11	2013-11-09	XXX 老师推荐了批判性思维，没想到今天 XXX 老师也推荐了，对提高逻辑思维有好处。拜读！！！ (Our teacher XXX recommended a CT book and another teacher XXX recommended it too. They say it is good for improving logic.)
12	2013-11-08	逻辑和批判性思维在这里行不通，因为这只会招致无聊、虚无、和愤怒的攻击。所以这些都正常得很，啊我在说什么。 (Logic and CT will not work here. Because they will only lead to boring and empty and angry attacks. So these are normal. What am I talking about.)
13	2013-11-08	Re-tweet the post above
14	2013-11-08	
15	2013-11-08	
16	2013-10-27	华威大学第三届华语辩论校内新生赛招募辩手啦！想拥有缜密的逻辑和强大的批判性思维? 如果你需要的是系统的训练 (We are looking for participants for HuaWei University's third debate competition. Want to have rigorous logic and strong CT? If you need systematic training.)
17	2013-10-27	Re-tweet the post above
18	2013-05-24	XXX：如果大脑神经网络里的逻辑回路从小就搭错了，不管什么样的批判性思维，绕来绕去，只会绕进旁门左道。

		(As said by XXX: if one's logic is wrong in his brain, no matter what kind of CT, he will only get into a wrong way.)
19	2013-02-01	批判性思维能帮你从逻辑和理论上来思考工作方向 (CT can help you to think direction of work based on logic and theories.)
20	2012-08-14	新 gre 写作题目更加具体，考察考生完成题目过程中是否能够融合批判性思维和分析写作能力，以便更好的研究生院和商学院所学需思维方式，所以新 gre 写作备考过程中我们如何清洗表达自己的逻辑思维是非常重要的 New GRE writing questions are more specific in testing if students can use CT and analysis during completing the tasks, in order to better understand thinking methods of postgraduate schools and business schools. So in preparing for the new GRE writing tests, it is very important to know how to express our logic.
21	2011-07-03	培养独立思维 和批判性思维能力，有利于学生观察能力，注意力和逻辑思维的能力培养 (Cultivating independent thinking and CT is beneficial for cultivating students' abilities of observation, attention and logic.)
22	2010-10-16	分享日志 前途不前途 幸福不幸福 还有一年，已经觉得在学校里学不到什么东西了。这几年唯一学到有价值的事情就是逻辑和批判性思维，所谓自由之精神，独立之人格。至于知识，会写点函数，零星记得考试时背过的几句话，

		其他什么都没有 (There is one more year before graduation and I already feel there is nothing I can learn in this university. The only things valuable I have learnt in these years are logic and CT, i.e. a free spirit and an independent personality. As for knowledge, I know a bit about writing mathematical functions and something I recited for exams. Nothing else.)
23	2014-05-14	“中国教育的最大问题是，不提供建构逻辑一致性科学体系的思维工具（哲学，逻辑学，批判性思维，还有宗教的知识）。”别人说的，说得很好！ (I think this saying is good: The biggest problem of Chinese education is that it does not provide thinking tools for building a scientific system being consistent with logic, including philosophy, logic, CT and knowledge about religion.)
24	2012-02-17	批判性思维，正确的思维方法，对一个人的生活影响之大显而易见，人一辈子非要看一本叫大家如何进行逻辑思考的书 (CT, correct thinking method, is obviously influential for a person’s life. In our life, people must read a book teaching how to think.)
25	2008-04-09	西方思维的基本概念源于 2300 年前希腊的“三位一体论”，并建立在批判性和争论性的基础之上。 苏格拉底普遍地强调逻辑与辩论 (Western thinking is based on the Greek

		theory of the trinity which was proposed 2300 years ago and is based on CT and arguing. Socratic always emphasise CT and debate.)
26	2007-12-09	XXX(转自 XXX）：先学逻辑再讲批判性思维 (Learn logic before CT.)
27	2014-05-06	吐槽需要严密逻辑、庞大知识储备、融会贯通全息批判性思维、耐冷解嗨控场力、对目标读者群把握 (Criticizing needs rigorous logic, large amount of knowledge, comprehensive CT, ability to break the awkward silence and know the target audience.)
28	2015-04-01	以逻辑方法作为基础，结合人们日常思维的实际和心理倾向发展出的一系列批判性思维技巧。 (Taking logic as the basis and combining people's daily thinking and psychological tendency to develop a series of CT skills.)
29	2015-04-24	Re-tweet the post above
30	2015-04-15	
31	2015-04-27	
32	2009-12-29	其目的是帮助学生提高批判性思维能力和想象力，学会发现和鉴别事实真相，坚持对事物进行严谨的分析，能够理性、历史地认识现实问题和道德问题。 (The goal is to improve students' CT and imagination, let them learn how to discover and discern the facts, let them insist rigorous analysis and be able to understand real problems and moral problems rationally and historically.)

33	2009-12-29	Re-tweet the post above
34	2010-02-02	

2.6.2 Understand CT as doubting

	Time of the post	Quotes from the texts
1	2012-09-23	批判性的思维已经有了许多不同方式的定义。简单地说，它不只是接受表面价值的一个关键或批判的方法。 (CT has many definitions. In short, it is a key or critical method to know how to not only accept what is on surface.)
2	2014-04-14	所以保持批判性思维是蛮重要的 至少不能人云亦云… (So CT is important. At least one we must not just say whatever said by others.)
3	2014-04-15	Re-tweet the post above
4	2014-07-25	以一颗宁静之心，远离浮躁喧嚣，浸淫中外经典，锤炼修齐治平的情怀，锻造解释、分析、评估、推论、说明和自我校准能力的批判性思维，成为求真问实的提问者. (Have a peaceful heart and stay away from the noise world. Immerse into Chinese and foreign classics to build abilities of explaining, analyzing, evaluating, reasoning and CT of self-correcting, and therefore become people who ask questions to seek for truth.)
5	2014-08-01	如果只听一方的只言片语，那这个世界没有事实 (If only listen to one party, there is no truth in the world.)
6	2014-08-01	Re-tweet the post above

7	2013-12-16	没有批判性思维的所谓兼听，就是被洗脑的过程。 (Without CT, which is listening to both sides, it is a process of brainwashing.)
8	2013-11-16	can't agree any more！生化随便一个点深挖就是一个paper.知识和问题，一个都不能少。转自生物系科协 生物系科协 :【新进PI面对面】批判性思维，不要对书本对老师take for granted,看文章一般看摘要和数据，不太在意conclusion,得出自己的结论，能学到更多 (Can't agree any more! In Biology and Chemistry, by digging any point deeper one can form a paper. Knowledge and questioning are both important. Transfer a piece of information from the Association of Biology: CT is to not take what is written on the books or what is said by teachers for granted. When reading an article, look at the abstract and data. Don't pay too much attention to the conclusion. Reach your own conclusion and you will learn more.)
9	2012-03-21	批判性思维的一种表现方式。要对看到的、听到的东西进行分析，才能透过表面，透彻的了解事情的本质 (CT is a way of expressing. Only by analyzing what we see and hear can we see through the surface and know the essence.)
10	2012-07-02	Re-tweet the post above

2.6.3 Understand CT as not always doubting and self-doubting

	Time of the post	Quotes from the texts
1	2014-03-10	学会批判性思维的第一步，首先是要拒

		绝走极端，避免一棍子打死的思维。 (The first step in learning CT, is refusing going to extremes and avoiding denying everything absolutely).
2	2014-03-10	Re-tweet the post above
3	2014-03-10	
4	2014-07-24	批判性思维是看到真相前不轻易相信，而怀疑一切则是屌丝干的事 (CT is not believing casually before seeing the truth, while doubt everything is the mediocre people's action.)
5	2014-07-24	怀疑一切不是一种怀疑，你只是在怀疑那些你相信的东西。 (Doubting everything is not doubting. You are just doubting those you believed.)
6	2014-07-24	Re-tweet the post above
7	2014-08-26	抱着每一本雅思非官方出品的资料都可能有错的心态来看那些各大机构出和老师出的书，这样的学习是在培养批判性思维吗？ (Reading those books written by institutions and teachings with the thinking that all the official IELTS books can be wrong. Is this cultivating CT?)
8	2014-02-15	看着豆瓣上这一群装X的人默默冷笑 以为自己批判性思维有多了不起无论什么书都是以否定的态度 也不想想自己有没有这样的资格 还反倒污染了书本身的神圣感 Those people on Douban were ridiculous. They think their CT was extraordinary. They think negatively about any book. They did not think about if they were qualified to

		do so. They defiled the holy of books.
9	2014-02-17	Re-tweet the post above
10	2014-07-05	批判性思维的精髓是自我批评 (The essence of CT is be critical to oneself)
11	2014-07-08	Re-tweet the post above
12	2014-07-12	
13	2014-08-22	所谓的“批判性思维”不是别人说什么你都说“不”，而是你在理解接受别人观点的基础上坚持捍卫自己的立场。——致某些脑残喷子 (The so-called CT is not to say ‘no’ to everyone’s claims, but to defend your claim based on understanding others’ opinions. To some ridiculous criticisers.)
14	2014-08-23	Re-tweet the post above
15	2013-12-06	还有什么比以为独立就是批判别人更可悲的 我就从来不知道什么是批判性思维 只是别人的东西和我有不同然后指出来进行交流而已 但很多人只是依靠批判的幌子去合法得攻击别人以显得自己多优越多么不从众而已 (Is there anything more pathetic than thinking being independent is to criticise others? I never know what is CT but only pointing out how I think differently with others to communicate. But many people taking CT as a reason to attack others in order to show that they are superior.)
16	2013-11-26	一些人看到任何新闻都骂，因为他们看新闻刷微博不是为了获取信息、进行思考和参与讨论，而是为了发泄而发泄，他们批判任何人物和事件，但却没有任何批判性思维。

		(There are some people who criticise when they see any news. Because they are not reading news for extracting information, thinking and discussing but to vent. They criticise any people and things but have no CT.)
17	2012-05-12	弱的批判性思维：维护自己信念的一种方式。 强的批判性思维：要求批判所有的观点，包括自己的观点——批判自己观点，才能避免自我欺骗和盲从。 (The weak CT is a way to defend one's belief. The strong CT requires us to be critical to all opinions, including our own opinions. Only by being critical to one's own opinions can we avoid being cheated by ourselves and blind beliefs.
18	2012-05-12	Re-tweet the post above
19	2012-08-09	
20	2013-10-01	
21	2014-06-02	批判性思维，从来不仅仅意味着单纯的否定和评判。开放、审慎、自我警惕和反思都是它的有机内涵。求真，也有着同样的要求吧。 (CT never means simply denying and judging. Open-mind, carefulness, bewaring of one-self and reflection are all content of CT. Seeking for the truth should have same requirement.)
22	2013-10-26	尝试换一种思维来思考平常生活中的琐事，批判她人从评判自己做起，我要从自己身上开始找茬，欢迎各种吐槽和辱骂批评。 (Try to think events in daily life by another way. Critiquing myself before critiquing

		others. I will find my own flaws. You are welcome to give me critiques and criticizing.)
23	2012-05-15	人们都有反思性思考的能力，但这种能力有强弱。这种反思性思考的能力，本文称之为批判性思维 (Everyone has the ability of thinking reflectively. But some people have stronger reflective thinking while some people have weaker reflective thinking. This ability of reflective thinking is regarded as CT.)
24	2012-04-12	做一个会反思的助人者 学生理解能力和批判性思维的最好方式。 (Be a reflective helper. The best way of students' ability of understanding and CT.)

2.7 Posts talking about CT and emotion

	Number and time of the post	Quotes from the texts
1	2014-03-22	饱含感情色彩的词语，可能会让思维短路，所以，要练习批判性思维 (People's thinking can be short out because of emotional words. So there is a need to practice CT.)
2	2009-10-16	在学习心理学的时候，老师在教授我们学习方法时首先就提出了要有批判性思维。 批判性思维，是基于充分的理性和事实，而非感性和传闻来进行理性评估与客观评价 (When we were studying psychology, our teacher firstly taught us that we need to have CT. CT is to evaluate and judge based on sufficient rationality and facts, instead of

		emotion and rumors.
3	2012-09-23	如果你不是一个用批判性思维的人；我们可以做些事情来提高我们批判性思维的能力。例如，试图去依靠理性，即根据我们对逻辑的思考而不是凭借感觉 (If you are not a person who has CT, we can do something to improve our CT. For example, try to use rationality, i.e. thinking according to logic instead of feeling.)
4	2012-05-08	太多愤青了，累了，感觉不会再爱了。不知道现在的人都是什么心态，事情都特别喜欢往坏处想。身为一个积极，阳光的好少年，最近被一堆消极情绪刷屏式非常痛苦的一件事情。盲目乐观是不对，但这不代表揣测讽刺就是所谓“批判性思维”。 (There are too many angry young men nowadays. I feel I cannot love again. I do not know how people’s mind work nowadays. They think negatively about everything. As an active and sunshine young man, I feel very painful because of these people’s negative emotions. Being optimistic blindly is wrong, but this does not mean doubting and mocking are the so-called CT.)
5	2012-05-05	现实中的我们，往往懒得动脑筋，懒得分析，又勤于“凭感觉”，让我们离批判性思维越来越远，离无意识的“混沌”生活越来越近。这使得我们越来越不理性、冲动，容易让我们离所设定的目标和理想的生活越来越远。

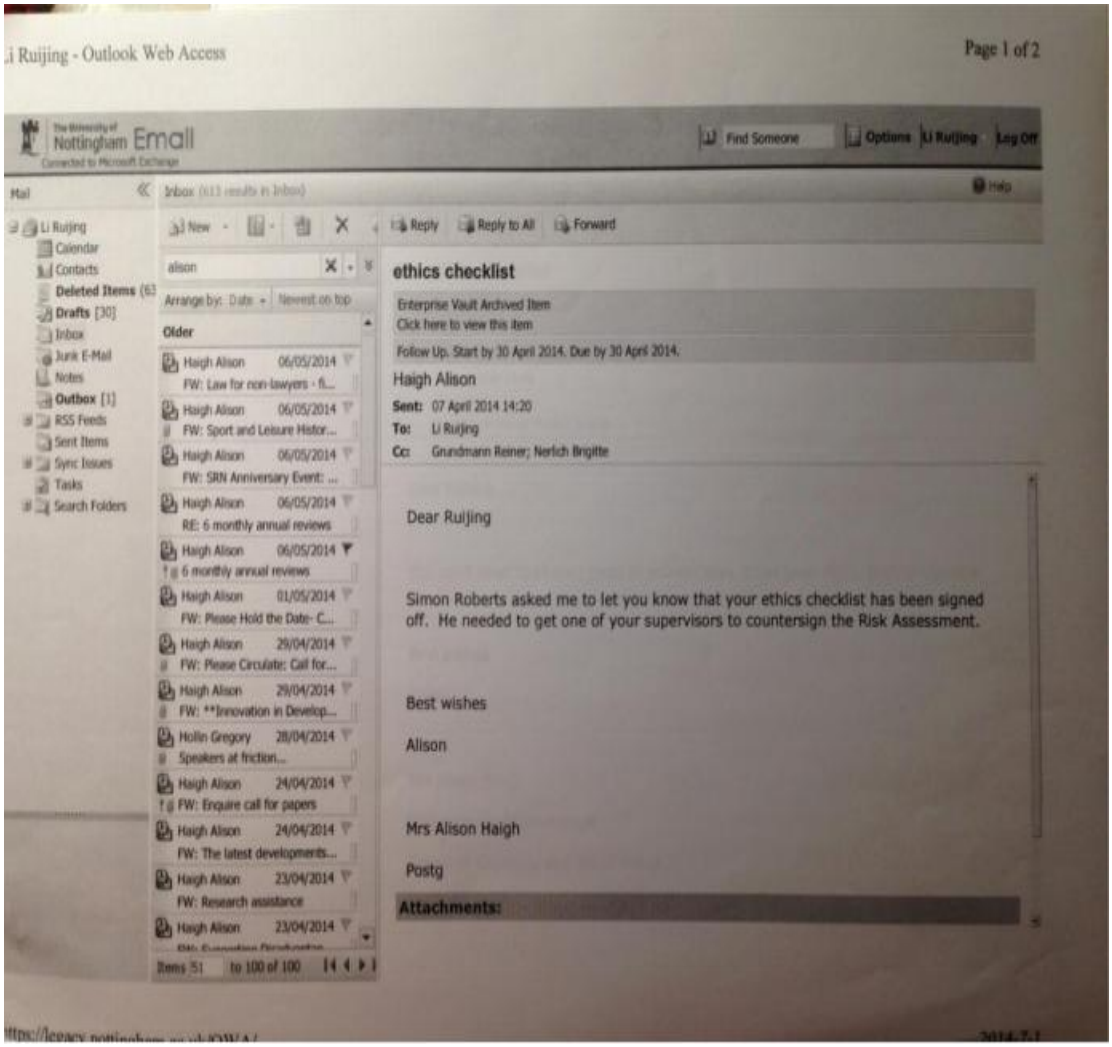
		In real life we often too lazy to think or analyze but tend to depend on our feelings. In this way we stay away from CT but close to being unconscious. This makes us become more and more irrational and blundering. This keeps us away from our goals and ideals.
6	2012-03-20	我们只根据实践经验和逻辑的理由来判断论证的优缺点。卷入的其他因素常常是我们说的无关的谬误，比如诉诸权威、大众、情感、传统、威胁等。 We only judge the strength and weakness of an argument based on experience and logic. There are some other factors, often fallacies, getting involved. These include appealing to authority, the majority, emotion, traditions, threats, etc.

Note: the name of the writers of the Renren posts are replaced by XXX in these appendices.

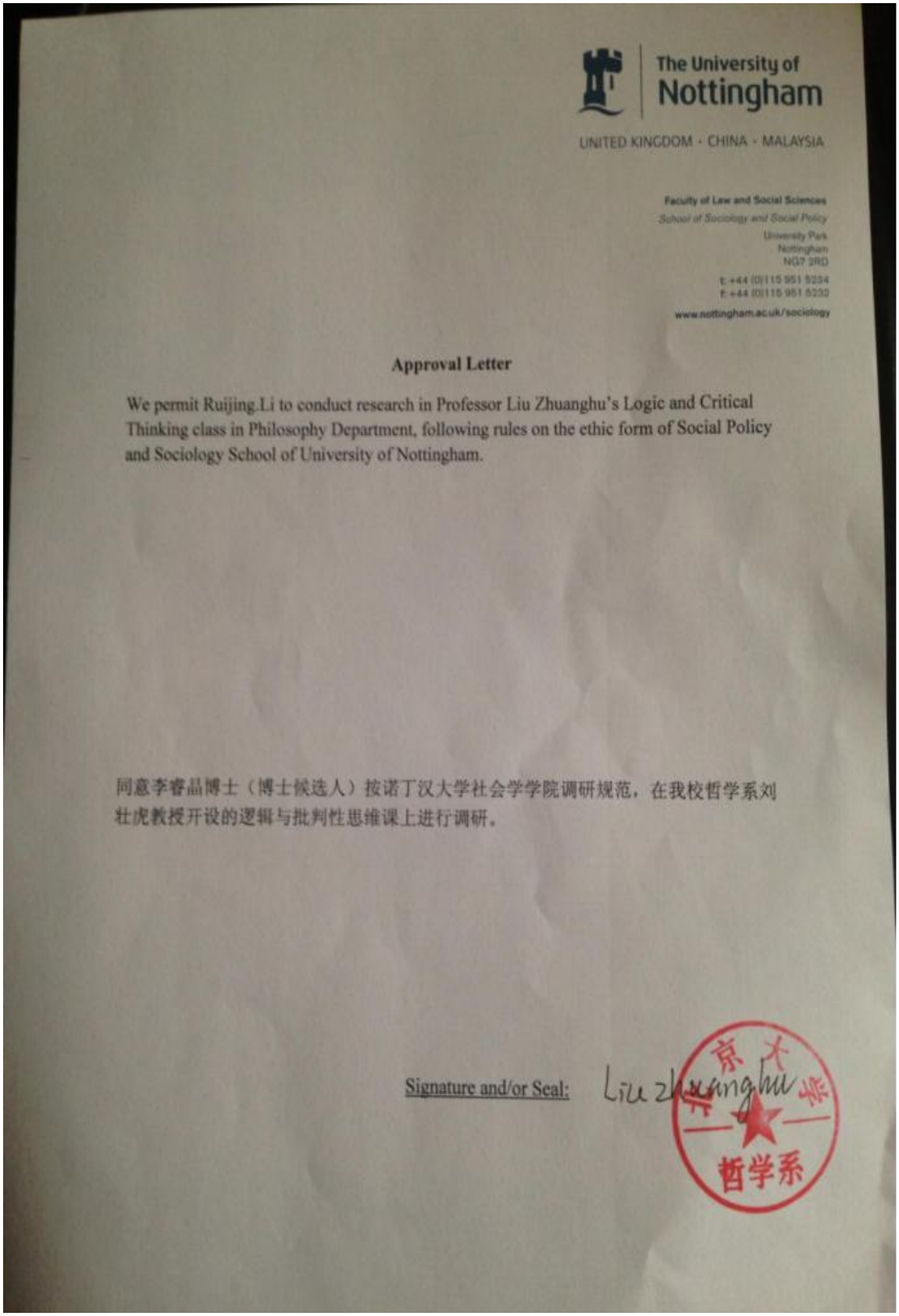
Appendices for Ethical Review

3.1 Approval Letters

Approval Letter from the School of Sociology and Social Policy of University of Nottingham:



Approval letter from Peking University and the lecturer:



The University of Nottingham

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Approval Letter

We permit Ruijing.Li to conduct research in Professor Liu Zhuanghu's Logic and Critical Thinking class in Philosophy Department, following rules on the ethic form of Social Policy and Sociology School of University of Nottingham.

同意李睿晶博士（博士候选人）按诺丁汉大学社会学学院调研规范，在我校哲学系刘壮虎教授开设的逻辑与批判性思维课上进行调研。

Signature and/or Seal: Liu Zhuanghu

京大学 哲学系