Understanding Chinese International Doctoral Students Develop Critical Thinking in a Cross-cultural Learning Setting

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Abstract: This paper explores the experience of how Chinese international doctoral students develop critical thinking. Narrative interviews are conducted. Narrative thematic analysis is adopted. Four big themes are generated, which are understanding of critical thinking, comparison and contrasts, factors contributing to development of critical thinking and improvement in critical thinking. There are several categories in each theme. Direct quotations of the participants are presented as evidence under each theme. The implications and future research are presented as well.

Keywords: narrative research, narrative inquiry, narrative thematic analysis, critical thinking

In this age and time where globalization and internationalization are unavoidable trends, cross cultural learning and traveling become prevalent and norm. In higher education setting nowadays, it is common to have large numbers of international students from various countries as well as faculties with international backgrounds. Among all these international students, students from China consist of the largest percentage (CIE). Education in China has been viewed as exam-oriented, teacher-centered, and memorization-stressed while education in the US has been regarded as quality-oriented, student-centered, and critical thinking stressed. In addition, China and US have different ideology, culture, and political systems. All these differences might lead to some difficulties for Chinese international students studying in U.S. higher institutions. And among all the difficulties that Chinese international students face, trying to think critically as their US peers receives a lot of attention.

Critical thinking has long been stressed in education, though there has never been a universal consensus regarding the definition of the term. However, there are some overlapping understanding of critical thinking. For instance, Moore (2013) summarized seven definitional strands of critical thinking: judgement, skepticism, simple originality, sensitive readings, rationality, activist engagement with knowledge, and reflexivity (Moore, 2013, cited in Luca, 2018). Several other authors have defined critical thinking as a set of cognitive skills such as interpretation, analysis, inference, and evaluation and dispositions such as being open-minded, inquisitive, far-minded (Luca, 2018). There is a debate on critical thinking of international students, especially Chinese students in U.S. universities. Some perceive Chinese international students as lacking and deficient in critical thinking due to teacher-centered classroom instructions and exam-oriented educational system in China (Badger, 2019; Heng, 2018). Yet, others believe that Chinese international students are not deficient in critical thinking and that the reasons that U.S. faculties and peers' perceptions of otherwise are due to Chinese international students' challenges in language skills and communication styles, differences in culture and thinking modes, and unfamiliarity with educational environment and general social cultural environment in the US. (Heng, 2018; Lu & Singh, 2017). Despite the debate, there are some

Chinese international doctoral students who have demonstrated their critical thinking capability and dispositions by achieving academic success in U.S. higher education institutions.

The purpose of this study is to understand how Chinese international doctoral students perceive critical thinking while studying in the US. Specifically, the study attempts to explore their experiences of reflecting and developing critical thinking processes:

1. What are Chinese international doctoral students' experiences of critical thinking studying and living in the US?
2. How Chinese international doctoral students recall, reflect, and narrate their development of critical thinking?

Methodology

Data Collection Process and Procedures

This is a pilot study, so the researcher conducted narrative interviews with only two Chinese international doctoral students. One participant is an electrical engineer Ph.D. student and the other is a mechanical engineer Ph.D. student. Both acquired their master's in China and came to the US to pursue a Ph.D. Pseudo-names were assigned at the participants' preference. After the researcher explained the research project to the participants, the participants signed the consent forms and volunteer to participant. The interviews followed semi-structured structures but ensured free narration of participants. The researcher attentively listened to the participants and did not interrupt when the participants narrated. After the narration is done, the researcher asked follow-up questions to clarify the unclear areas or develop further from the narration. After the official interviews, the researcher and the participants collectively reflected the interview experience.

Data Analysis Process and Procedures

Oliver et al. (2005) proposed the range of transcription practices with naturalism at one end and denaturalism at the other. Denaturalism is a practice where for example, "stutters, pauses, nonverbal and involuntary vocalizations are removed" (Oliver et al., 2005, pp. 1273-1274). The researcher used denaturalism when transcribed the interviews. The researcher did two rounds of coding and adopted what Braun and Clarke's (2016) proposed, which is the six phases of thematic analysis to analyze the data. The first step is to read the data from the beginning to the end. The second step is to generate initial codes, grouped and summarized data, and took notes and wrote down the main points of clustered data that expressed the same meaning. The third step is to search for categories. The fourth step is to search for patterns. The fifth step is to name categories and provide extracts to support definitions and names. And the final step is to provide re-presentation of analyzed data, categories, and overarching theme.

Findings

Four themes generated from the data, understanding of critical thinking, comparison and contrast of critical thinking training between China and the US, what helped develop critical thinking,

and improvement in critical thinking. Within each theme, there are several categories, within which there are codes and quotations to support them. The specific findings are presented below.

Understanding of Critical Thinking

One participant, Xiaoming was not so sure what I mean when I said critical thinking whereas the other participant, Shawn smoothly answered my question after I mentioned critical thinking, which showed that he is certain of what I mean when I said critical thinking. Later, Xiaoming told me that he first heard of the concept of critical thinking in the domain of philosophy and deemed it a philosophical concept.

Critical thinking is using evidence to reach justified and reasonable argument. As Shawn stated: "critical thinking is making justified, objective and fair argument." Similarly, Xiaoming said: "we need justification and using sufficient powerful evidence to form opinions" and "we should have justified argument and evidence to defend." Debating is an important way to train critical thinking according to both participants because it provides a platform to practice justified reasoning.

Critical thinking is the ability to remedy or improve theories and hypotheses. In electrical engineering, students often need to come up with hypotheses and theories, test them and remedy them. Thus, it is vital for them to have the critical thinking level that is enough to detect areas to improve or remedy. As Shawn said: "we need critical thinking to be able to remedy and improve the theories or hypotheses."

Critical thinking is skeptical thinking and creative thinking. Xiaoming said that "authorities are not always right, if the teacher said something wrong, I could bring it up." Shawn said: "skeptical thinking and creativity are critical thinking" and "without critical thinking, there is no creativity and innovation. Critical thinking is important to do Ph.D."

Critical thinking means different perspectives. Xiaoming stated: "critical thinking is everywhere as long as people have different opinions." Shawn stated: "different angles and perspectives demonstrate critical thinking."

Both participants agree that critical thinking is generalizable and applicable to various fields. As Xiaoming said, "things all have something in common, you learned critical thinking here and you can apply it somewhere else."

Comparison and Contrast of Critical Thinking Training between China and the US

The comparison and contrast are bounded within these two participants' experiences and not applicable to broader context or population. What I found from these two participants' experience is no distinguishing differences in terms of critical thinking training between their experience in China and the US except the environmental and cultural differences. Xiaoming said:

> We cultivate critical thinking in China but we just don't mention this term" and "even earlier when we were in elementary school, we began to divide the work of cleaning up

> the classroom among the group members. We have to assign the tasks to different people. Critical thinking is involved.

Shawn also said: "we cultivate critical thinking since junior and senior year in college in China" and

> There is no difference between China and America in terms of critical thinking training except here in America classroom atmosphere is more active, They encourage to express yourself vocally but in China, we have the ideas but we don't say them, however, we can write them down.

In this light, it feels more like a continuity for both participants to continue their studies in higher degree level instead of a huge gap in between master's and doctoral level for them to jump. Yet, they did mention minor differences such as in China, the exams they take have single correct answer while in the US they can have multiple correct answers and in China, they suffer from limited teacher-resources per student.

What Helps Develop Critical Thinking

In their learning experience in doctoral programs in the US, there are some factors contributing to their development of critical thinking, which are lab group meeting, doing projects, solid foundation and accumulating understanding of the field, and communication and cooperation.

Lab Group Meeting

Both participants have weekly lab group meetings and comment that they help develop critical thinking. Shawn stated: "we debate to reach reasonable and justified conclusions in lab weekly group meetings." Xiaoming explained in more details of what they do in lab weekly group meetings:

> We do formal presentations. We have to review things, find out the advantages and disadvantages of things we reviewed. Everyone in the group has to present each week of what we have read in this week. It requires critical thinking from both sides. The presenters have to have critical thinking. The listeners also have to have critical thinking to critique and provide suggestions and advices for the presenters. This lab group presentations offer a change to formally discuss the research. Everyone listens carefully and offers constructive feedback. Presenters take time to prepare and have to present systemically. In China, we also talk about research, but no one will pay attention to your research, let along providing feedbacks. They don't care about your research. Only your advisor cares about your research in China. It is really good to have this formal format here to present. It fosters systemic thinking to present and critiquing skills to listen. And when I hear something good from other presenters, I will learn and imitate. Next time when I present in the meetings or even when I go to conference, I can apply it to my own presentations. And when critiquing others' work, try not say useless things. There are two reasons that contribute to saying useless things. One is that the presenter doesn't express his ideas correctly or clearly, the other is the commentator just is an amateur and non-expert so that he just randomly commented something wrong.

Lab weekly group meetings becomes a vital way for engineers to share their readings, their own research ideas, comment on each other's work, foster systemic thinking and critiquing skills, thus helping them develop their critical thinking.

Doing Projects

Doing projects is another commonality between the two participants regarding things to help develop their critical thinking. Also, doing projects is a distinguishing assignment they have in the US, which is different from their experience in China. Shawn said: "project is a way to train and demonstrate critical thinking" and "open-ended questions can foster critical thinking better." Similarly, Xiaoming said: "Project is a distinguishing assignment in US and it demonstrates critical thinking" and "the process of doing a project resemble real life scenarios of engineers." He further narrated his experience of doing a long-term project:

> We were designing mechanical arm as part of the mechanical design. We divide the whole project into different phases. For example, develop the bottom first then the middle part, then the top. After each phase, we will meet together and review and discuss it. Various parties will participate in the review session, such as the advisor, project leader, experienced engineers and we will even do role play to act like the party A in the contract who propose the requirement. Some of them will act as non-expert to propose ideas from the perspective of a customer with no background knowledge of the field. This is party B from the contract to propose requirement. Each member will talk about the project from different angles and perspectives of different stakeholders. But some advices and suggestions are junky and useless, but most suggestions and critiques are helpful.

By taking the position of various stakeholders, they learned the issues from fresh angles, thus helping them identify new problems and ways of solving them. This process resembles the real working process of professional mechanical engineers and is both the manifestation and fostering of critical thinking.

Solid Foundation and Accumulating Understanding of the Field

Both participants stress the importance of the establishing a solid foundation of the field to developing critical thinking. Reading and doing can help accumulate the knowledge and understanding of the field. As Xiaoming stated, "the more you read, the more you can remedy, or even overthrow others' ideas" and "experience is important. Through doing and experiencing, you accumulate and build a solid foundation of the field." In a similar vein, Shawn stated: "a solid foundation of the field is the premise of critical thinking.

Communication and Cooperation

Both participants show the importance of communicating with others, learning from others and building strong connections. Shawn said: "we speak up in class and can hear different angles and perspectives in classroom. There is no one single standard answer here." He also said: "we cooperate and collectively create models. I can learn from more experienced colleagues and professors. I have the chance to be exposed to different perspectives. It really helped me develop critical thinking." Xiaoming echoes as "communicating with others is an important way for me to develop critical thinking." As an outlier, he thinks of watching news as a way of fostering critical thinking because news reflects the biased positions and standpoints of the source origins.

Improvement in Critical Thinking

Both participants achieved progress and improvements in critical thinking during the experiences of studying in doctoral programs in the US. Shawn said: "I can think more systemic and holistic now. Establishing solid foundation of the field is vital. Now as I have accumulated more, I can think more critically. Xiaoming said: "Initially, I struggled because I didn't know the grading criteria. But later I found out that the grading criteria here is good that hard working is given credit" and "another difference from the initial stage is now I have skeptical thinking and I question the authority." Further, he gives examples of questioning authorities:

> For example, a certain type of screw, the number one in the industry, due to some other considerations, compromised and didn't use the best screw. But when you do it, you should think of a way to solve the problem that caused the compromise instead of just following the authority and using the unreliable screw. Also, when having lab group meeting, I can question my advisor now. I used justified evidence to defend my opinion and the advisor was persuaded and changed his original critique. The advisor may be more well-rounded and know broader in the field but he is not doing the project and the student who actually does the project knows more details about the project and is a better expert in term of the particular project.

Conclusion

Chinese international doctoral students have grown into more systemic and skeptical thinkers after studying in U.S. Ph.D. programs. Lab meetings, doing projects, collaboration and corporation, and building a solid foundation of the subject helped develop critical thinking. Such findings add to the knowledge base and inform the students, educators, and the public. Further research with broader and varied sample is necessitated.

References

Braun, V. and Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77-101. http://eprints.uwe.ac.uk/11735

Clandinin, D. J. (Ed.). (2007). *Handbook of narrative inquiry: Mapping a methodology.* Sage.

Heng, T. T. (2018). Different is not deficient: Contradicting stereotypes of Chinese international students in US higher education. *Studies in Higher Education*, *43*(1), 22-36.

Mertova, P. & Webster, L. (2020). Using narrative inquiry as a research method: *An introduction to critical event narrative analysis in research, teaching and professional practice* (2nd ed.). Routledge.