

A Perspective of International Ph.D. Education in China

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Abstract— Studying abroad is a unique opportunity since it aims at extending the students' scope and level of learning and comprehension of diverse cultures. Exposure to international learning leads the students to develop their language and verbal skills. Simultaneously, it motivates them to construct their viewpoint as well as, an insight into the multicultural comprehension of their discipline. Thus, developing and grooming their personality, proving significant in their future endeavors. China has become one of the popular choices for foreigners aiming to pursue higher studies. The strength of students selecting China as their host is increasing annually under the Chinese scholarship council and other bilateral scholarships. This article provides a detailed overview of the foreign doctoral scholar's experience of research and learning environment in China. A meticulous comparison has been drawn to appreciate the substantial endeavors of the Ministry of Education China to project cultural learning and education. Moreover, China's outlook and contributions to providing generous learning opportunities are commendable. China has opened new horizons for the talented students of developing countries, especially Belt Road Initiative (BRI) partners. Amid the pandemic enrollment across the globe has changed drastically. As a foreign Ph.D. candidate studying nuclear engineering program, the author would share his research experience and culminate by humbly suggesting a few constructive points to further make the foreign research experience effective for overseas students.

Keywords— Studying abroad; Chinese scholarship council; overseas students; Belt Road Initiative.

I. INTRODUCTION

Presently, approximately half a million foreign students are studying in China [1], [2]. Nearly, half of them are enrolled in various degree programs. Amongst them, the strength of pupils from the developing world is enhancing rapidly comprising countries like; Pakistan, Afghanistan, and others that are part of China's Belt and Road Initiative (BRI), a worldwide infrastructure-construction project [3].

It has been observed that the strength of international students has multiplied almost four times from 2004 through 2016 [1], [4]. While it's interesting to analyze that the strength of pupils from BRI-connected countries has grown approximately eight times [5]. According to a survey, China has reserved 10,000 of its scholarships annually for the BRI-involved countries' pupils. Unlike, Europe, UK, and American universities, where only well-off foreign students are enrolled to gain monetary benefits, China provides handsome subsidies to international students [1], [6]. Mostly, they are well provided and enjoy better facilities than the Chinese students. Last year the Ministry of Education allocated a budget of 3.3bn RMB for them, 16% more than in 2017 [2], [7]. China is also promoting university education to make its bonds stronger with other countries most importantly the BRI countries. Studying in China would make students know more about China's political and social system. Thus, enlightening them about the orient without any western prejudice [2].

A vast majority of overseas students are being registered in degree programs apart from opting for Chinese language courses only. The standard of international research and education in China is up to the international level and is making its mark globally. Majority of the Chinese universities are equipped with advanced, top-notch facilities and resources. Hence, gaining the attention and confidence of international talents. The striking highlight of seeking higher education experience in China for foreign students is the acquisition of an affordable degree. In numerous developing countries students try to acquire European or American scholarships. China is helping such deserving students academically and the China-Pakistan Economic Corridor, a grand BRI project in Pakistan would ensure potential employment opportunities for them too [8].

The primary aim of this report is to acquire a better understanding of the ways and means adopted by Ph.D. students studying in China to achieve academic success and the methods by which they manage to get this sort of success even while they are experiencing cultural diversity and variations of

the Chinese culture and society. The perception of academic achievement may be developed by keeping in view the psychological features as well as values incorporated in the academic discipline and the outlook features of prospering culture. The strategies used to gain such kind of achievement may as well stress upon personal behaviors and attributes, institutional motivation and anticipation, and cultural values. This study highlights the learning environment, study status, and research experience of overseas students. In the following sections, the authors have discussed steps taken by the China Ministry of Education during the past few years, followed by Ph. D degree requirements and research culture in the schools. Moreover, the author culminates the study by sharing his own experience and achievements while giving some opinions based on his experience in the end.

II. CHINA’S POPULARITY IN HIGHER STUDIES

Foreigner students studying in China conceive this concept of success by achieving the milestones set by their advisors and institutes. The increasing number of students pursuing doctoral degrees from China every year is evidence of the satisfaction and confidence in the standard of education and success rate of China’s Ph.D. candidates. China has embarked on an effort to become a hub for international students. The goal of the ministry was to achieve an enrollment of 500,000 across the globe in 2020 as reported by world education services (WES) and targeted by the ministry of education as shown in Figure 1.

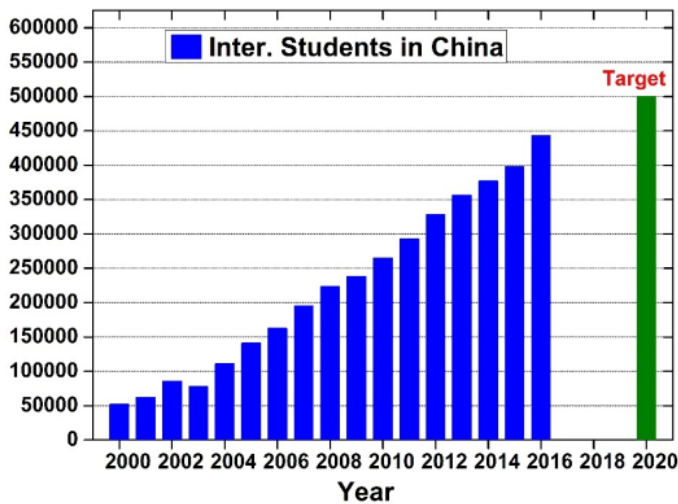


Figure 1. Enrollment of international students over the past decade (adopted from Paul et al. [9]).

The Ministry of Education has affirmed that around 500,000 foreign students studied in China in 2018, which is more than in 2017. Around 492,185 international students from 196 countries studied in China the previous year. It has been anticipated that in 2020, there would be approximately half a million foreign students will enroll at Chinese universities due to various government measures like One Belt, and One Road. China’s sole motive is to bring in international students. The students pursuing master’s and doctoral degrees have enhanced by 12.28 percent to 85,062. The undergraduate-level students are mostly self-funded, making up 87.19 percent of the total. A survey demonstrates that the Chinese administration has

permitted an increased strength of foreign students to seek higher education in different disciplines. Around fifty thousand international students have admitted in 2017 across the globe who were bestowed CSC. Most of the awardees were major program students (i.e. 51,600) and 69.57% (i.e. 40,800) won master’s and graduate scholars. In 2016, there was a 20% increase in major programs. The number of self-funded students was 430,600, making up 88.03% of all international scholars. Approximately fifty percent of these overseas students have been enrolled in Liberal arts programs, on the other hand, the number of students doing majors in Engineering, Management Sciences, Science and Technology, and Agricultural Sciences has enhanced by up to 20% every year [10]. The following section has divided into the experience of foreigners and the requirements for a Ph.D. degree. The report from WES has displayed that number of foreign students is increasing drastically as China is offering numerous scholarships and bilateral cultural language programs. The number of language students is offered language as well placement opportunities for most BRI and Silk Road countries. China has expanded its business and goodwill across the globe offering numerous scholarship programs in the last couple of decades. Table 1 represents the number of students admitted to China and the United States from different countries[10].

TABLE 1 . COMPARATIVE ENROLLMENT OF STUDENTS IN CHINA AND THE UNITED STATES (2016-2022) [11]

Nationality	China	USA
Algeria	992	192
Cambodia	2,250	512
Indonesia	14,714	8,776
Kazakhstan	13,996	1,792
Kyrgyzstan	3,247	216
Laos	9,907	91
Mongolia	8,508	1,410
Tajikistan	2,606	204
Tanzania	3,520	811
Thailand	23,044	6,893
Zambia	3,428	469

III. LEARNING ENVIRONMENT

According to a survey Ph.D., students studied and studied in China have been accomplishing good results, publishing quality papers, and getting good job offers. Doctoral training is a systematic way of gaining academic expertise and scholarly collaboration. It indulges educational learning and grooming of skills. Simultaneously, engaging the academic values and culture incorporation in a doctoral scholar. The doctoral programs offered to international students in China provide resources along with the ideal environment for this process [2].

Foreign doctoral students arrive in China, having their social backgrounds, anticipations, and norms. By selecting and contributing to formal and informal academic activities, they tend to acquire beneficial learning and skill sets. They communicate with peers and professionals, already established in their respective disciplines. Thus, leading towards contemplation and adaptation of their pre-conceived notions and knowledge [9]. Hence, making foreign doctoral scholars adjust to the Chinese milieu by meeting the competency

criterion by understanding the values of the community. Subsequently, the students achieve a high sense of working in a foreign environment, acquiring professional dexterity and work ethics after getting their doctorate. A survey shows that there are approximately 49% of international students pursuing degree programs, out of which 3% are doctorate candidates as demonstrated in Figure 2. Figure 2 shows the total number of foreign students accepted into top Chinese universities in Shanghai [1]. In terms of scientific contribution, a report published by Nature Publishing Group and Forbes revealed that China is among top five leading scientific research countries during the last decade [11], [12].

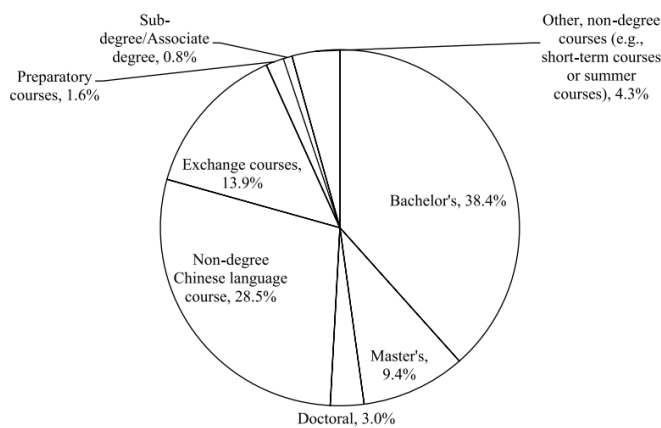


Figure 3. Distribution of international students in Shanghai in 2013 (adopted from Ding et al. [1])

A. Prerequisite for Foreigner Scholars for Ph.D. Award

In China, a doctoral candidate could obtain his/her Ph.D. degree in 3-5 years, on the condition that they have successfully finished their courses and concerned assignments like; a set number of international publications. But if he/she fails to meet the criterion, their graduation would be delayed till they fulfill the degree requirements. Usually, the degree span for such students is 6 years. A doctoral student is expected to have ample knowledge of the key concepts and basic research expertise of their respective fields as an independent researcher. Subsequently, it is anticipated that a qualified Ph.D. graduate would grow into an experienced professional in his/her respective research area.

Degree Prerequisites are as follows:

- The course works as prescribed by the school(12-15Cr Hours).
- Extensive literature review on the topic.
- Thesis proposal opening presentation.
- Participation in national/international conferences, lectures, and presentations.
- Publishing research papers (as required). Most of the schools required a web of science: science citation index (SCI) or engineering index (EI) for journal/conference papers.

- Mid-term evaluation.
- Doctoral dissertation reviewed by external experts to access the quality and level of the research.
- Syndicate council for degree evaluation.

In some cases, a major with Chinese as a language instruction is required to qualify for the proficiency test (HSK). As a whole, the doctoral study is dedicated to intensifying the doctoral candidates' learning and research expertise, by polishing their conceptual and moral basis. Henceforth, molding them into beneficial, independent individuals of society.

B. Scientific Research Methods Prevailing in China

China is offering doctoral degree programs in all disciplines including engineering, Science and Technology, Physical science, Literature, Liberal arts, Political Economics, Law, Education, History, Agri Sciences, Medical sciences, Military Science, and Management Sciences. Most of the universities in China have meticulous research-based programs for foreign Ph.D. scholars. It comprises participation in numerous research activities, having research assignments supervised by the professors. International doctoral Students obtain research expertise and betterment in their research abilities through such projects. Various co-curricular activities, such as; attending lectures, Summer and Winter exchange programs abroad, attending prestigious academic conferences, and publications in reputed academic journals, also enriches the learning experience of foreign Ph.D. students. Thus, international Students could interact with the academia beyond the doctoral program through these interesting activities organized by their host Chinese university.

As the guiding group in scientific and advanced innovation, doctoral students should be groomed to have a strong moral core, ready to step up and take the initiative, to play a vital role in the industrial revolution. The doctoral students are also needed to have a strong grasp of the basic concepts and technical aspects of their respective fields so that they could groom into confident, independent researchers. Hence, the doctoral program in China encompasses the aspects of increasing the ability of independent research and promoting innovation.

Commonly, international doctoral students studying in China have pre-selected their research field before their admission. After getting in, they usually do joint ventures with postdoctoral students, under their advisors' guidance. Their collaborators are equipped with detailed knowledge about their respective topics. Consequently, providing a set guideline for doing research.

C. Significance of Nuclear Science and Engineering

Presently, China is one of the biggest producers of nuclear power, all over the world. It has third ranking in total nuclear power capacity installed, as well as electricity generated. Thus, making up around one-tenth of nuclear power produced, globally. At present, Nuclear Science is undergoing new exploration and discoveries that tend to revolutionize it in the upcoming era. Currently, 440 Nuclear power plants are

working globally since, it is an eco-friendly, non-carbon emission power generation source. The enhancing global demand for clean energy leads to extensive research on nuclear power safety and cost-effectiveness. Hence, acting as a substitute energy source, globally. Furthermore, proving to be a potential energy source to diminish the looming energy crisis of the world. To minimize carbon dioxide emissions causing drastic climate change, we need to limit fossil fuels dependency and explore nuclear energy resources as its low carbon and can be produced at a large scale in the given time frame.

The author has completed a Doctor of Engineering in Nuclear Engineering. He has been an active participant in most of the formal and informal activities conducted by the university. He has found the academic environment highly competitive and deeply motivating. He has attended various educational visits, international conferences, informative seminars, and discussion forums organized by the school and College of Nuclear Science and Technology (CNST). The author has mastery of the subject and published numerous research articles in reputed journals and conferences [13]–[31]. The author's research focuses on developing computational models for multiscale simulation methods in radiation-resistant materials used for current and advanced reactors. In this regard, the author has published numerous research papers in high-quality journals and reputed conferences [13]–[31]. In the author's opinion, the nuclear engineering program at HEU is top level and under the umbrella of the Agency (IAEA), it has gained more attraction for the organization under IAEA [32].

Nuclear Engineering Program in China is very privileged, and Harbin Engineering University has been considered an exclusive nuclear education center all over China as well as a recent collaborator with International Atomic Energy Agency (IAEA). The College of Nuclear Science and Technology (CNST), previously named the discipline of Atomic Energy and Nuclear Power Plant, has been established in 1985. It specializes in the areas of scientific research and development, operations, design, and management of training experts in nuclear power [33].

CNST offers numerous opportunities in the field of Nuclear Energy as first class for postdoctoral research, along with doctoral and master's degree programs. Thus, abiding by the 211-project key of the development of vital disciplines. CNST also has the nuclear safety and simulation national innovation base, nuclear science and technology national virtual simulation experiment teaching center, nuclear safety and simulation technology key discipline laboratory of defense, accelerator and material research laboratory, experimental teaching demonstration center of Heilongjiang province, radiation technology laboratory of colleges and universities in Heilongjiang province.

IV. RECOMMENDATION ON PROGRAMS

In the author's opinion, a few suggestions can help to improve the program.

- i. The program should include an internship program for foreigners in industry or research institutes.

- ii. The teacher assistant (TA) / graduate research assistantship (GRA) opportunity for all Ph.D. and master's students must be included.
- iii. The program must be industrial-based (within certain limits as the technology is very sensitive).

CONCLUSION

In this article, we have provided an overview of higher studies in China as an engineering graduate. China is one of the second largest scholarships and advanced training-based providing countries. Numerous Chinese universities are considered top-notch as per the QS ranking. The Chinese culture is amazing and attractive for everyone no matter who comes from which part of the world. Studying China is a unique learning experience. The doctoral program fulfills the international requirements. The author has also provided a few humble suggestions that can improve the program for international students.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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