

Analysis of the Phenomenon of Deferred Graduation and Dropouts PhD Students in Guangdong, Hong Kong (China) and Macau (China) Greater Bay Area

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Abstract: Using the rooting theory, we interviewed and surveyed three universities in Guangdong, Hong Kong (China) and Macau (China) to explore the deeper reasons for the deferment of PhD students and analyzed them from four aspects: individuals, supervisors, institute and policies. Through comparison, the on-time graduation rate of PhD students in Hong Kong (China) and Macau (China) is higher, and the three aspects of PhD cultivation strategies in Hong Kong (China) and Macau (China), namely "guidance", "assistance" and "promotion", are outlined to provide reference for reducing the postponed withdrawal rate of PhD students. The study will provide a reference for the reduction of the postponement rate of PhD students.

1. Introduction

Since the establishment of the new degree system in 1980, after 40 years of development, the enrollment of doctoral students in 2019 has exceeded 100,000, the training scale of doctoral students ranks first in the world ^[1], and the development scale and speed of doctoral training are obvious to all. With the expansion of the recruitment of students, the national supervision of doctoral cultivation quality is also increasing, the training unit to improve the quality of doctoral training and academic level, increasing Dr Graduation conditions, Dr Graduation more and more strict, such as domestic university doctoral students in core journals published 2-3 academic papers as a defense condition, this disguised increase the difficulty of graduation. In the past three years, there has been frequent news that doctoral students have been expelled, including Tsinghua University, Fudan University and other well-known universities. The phenomenon of Guangdong universities is relatively prominent. In 2019, Sun Yat-sen University, South China University of Technology, Southern Medical University, Shenzhen University and other universities have eliminated hundreds of master and doctoral students. It has gradually become a common phenomenon that doctoral students are not up to standards and are delayed. According to statistics, the average on-time graduation rate of doctoral students in China in 2018-2022 is only 36.6%, see Table 1 for details. However, Google and Baidu searches found that few doctoral students in Hong Kong (China) and Macau (China) have been expelled.

The delay of doctoral students refers to the phenomenon that the doctoral student fails to meet

the standard graduation period required by the university and the doctoral student applies for the extension period to complete the study. The withdrawal is the phenomenon that the doctoral student is forced to be removed beyond the maximum study period stipulated by the university. Both are educational punishment in essence, but the degree of punishment is different, and the intensity of the punishment is greater. PhD extension and withdrawal are divided into active and passive. This study is passive doctoral delay^[2].

Table 1: Graduation table of doctoral students in mainland universities in the past five years

A particular year	2018	2019	2020	2021	2022
Doctoral students are expected to graduate	169435	174217	189744	189304	200480
The actual number of Doctoral student graduates	59503	61317	66176	70689	80772
Doctoral students' on-time graduation rate	35%	35%	34.8%	37.3%	40.2%

Note: Data source Ministry of Education statistical data from 2018-2022

2. Literature and current situation investigation

Through China network, d pu database query, time from 2000 to 2023, to subject words "doctoral repel" or "Hong Kong (China) or Macau (China) doctoral delay" 28 articles, to expand the scope of the search "graduate repel" also as a theme, a total of six journal papers, 1 master's degree, the overall literature is less, continue to expand the search scope of increased the "Dr Training", "Dr", "satisfaction" Dr keywords search literature 63 articles. Through Springer, Emerald and SAGE journals, the keywords "Doctoral Students" or "PhD failed" or "PhD drop out" or "PhD graduate" were used as the database database, and 18 relevant documents were found.

2.1 Domestic literature research on the delayed withdrawal of doctoral students

Domestic researchers mainly pay close attention to the following three directions.

Reasons for the delayed withdrawal of doctoral students, Meng Chengmin e^[3], who pointed out that the weak quality concept and no complete quality assurance system are two main reasons; Li Jingyue^[4], whose paper mentioned that the improvement of the training requirements, the structure of the unreasonable and the external environment; Li Haisheng^[5], who pointed out that the part-time study style, overseas visit, age and pre-defense system are negatively related to doctoral graduation. Bowie^[6], the influencing factors of delayed graduation are analyzed from three aspects of individual characteristics, academic interaction and college training mechanism. The analysis of the reasons for the withdrawal of doctors by domestic scholars is based on the doctoral training.

Late withdrawal strategy for doctoral students. Yang Hu^[7]from the extension of classified management, different treatment; forming responsibility sharing mechanism, improve the elimination mechanism, implementing comprehensive management, optimize the enrollment structure and improve the quality of students. Jun-ping huang^[8],based on the correct understanding of the delay of doctoral students, it points out the guidance in scientific research, the flexibility of the system, broadening the international vision, and improving the funding policy. The rope li hui^[9], who mentioned that the basic learning period should be reasonably set the quality of doctoral students, improve the quality of students, strengthen the construction of the tutor team, strengthen the management of the training process, scientifically formulate the academic achievement requirements, improve the investment mechanism of doctoral education, and other measures to solve the problem of postponing the graduation of doctoral students. Most domestic studies focus

on the phenomenon of delayed withdrawal of doctoral students and the analysis of related factors, and then propose the corresponding strategies.

Learn from the experience of overseas, Hong Kong (China) and Macau (China). Jin Chuanbao^[10], this paper analyzes the factors affecting the success of American doctoral students, including the good relationship between doctoral students and supervisors, the design of doctoral guidance activities, the establishment of staff training plans, and the doctoral students providing as much support as possible for the reference of domestic doctoral students. Domestic scholars are paying more attention to the postponement of doctoral students, but still less. Most problem-oriented strategies as the main way, and most of them put forward corresponding coping strategies, which have certain significance for guiding practice, less qualitative research, and the strategies are less based on the experience of Hong Kong (China) and Macau (China).

2.2 Foreign literature on the postponement of doctoral students

Foreign scholars often use of empirical methods to analyze the reasons for the delay of the withdrawal of doctoral students from different angles, and the proposed solutions are also highly targeted.

2.3 Investigation on the current situation of the postponement of doctoral students in Guangdong, Hong Kong (China) and Macau (China)

Table 2: Survey form of the basic information of doctoral students in the Guangdong-Hong Kong (China)-Macau (China) Greater Bay Area

Area	Delayed liquidation Whether there is	Standard educational system	Longest age limit	Publication of paper requirements	Doctoral supervisor	Reading blog type	Daily management
Another name for Guangdong Province	yes	More than four years	6-8 Years	Universal requirements for 2 to 3 articles	one-for-one	Full-time (985), concurrently reading system	Graduate school, college, and supervisor
Harbor	yes	Three or four years	5-8 Years	No clear requirements	One to one mainly, master and deputy tutor	Full-time mainly, concurrently reading system	College, tutor
An inlet of the sea	yes	Three or four years	5-7 Years	No clear requirements	Two to one	Full-time mainly, part-time reading system	College, tutor

Note: Data source: the official websites of each university

Through public data, literature and colleges and universities website, make a large bay area of Guangdong doctoral basic situation questionnaire 2, from the table of Hong Kong (China) and Hong Kong (China) are delay repel phenomenon, the standard of the same, Guangdong standard system is now more than 4 years, more than four years later can apply for extend the school year, such as reaching the highest study fixed number of year is repel. Hong Kong (China), Macau (China) divides full-time and concurrently read system commonly, full-time is 3-4 years commonly, concurrently read system is 4 years more, maximum number of years 5-8 years range, exceed

number of years can be removed or shunt. Guangdong universities generally have the requirement to publish papers.

It is concluded from Table 2 that there are both commonalities and differences in the three places. To investigate the specific reasons of Hong Kong (China) and I in 2020 QS ranking relatively close to, have doctoral training qualification three sample universities —— Guangdong A school, Hong Kong (China) B, Macau (China) C school delay repel and doctoral students as the investigation object, using root theory, in-depth interview, on the basis of the analysis of large bay area doctoral delay repel and reason.

3. Research technique

3.1 Study design

This study does not focus on the proportion of delay and withdrawal of doctoral students in the Guangdong-Hong Kong (China)-Macau (China) Greater Bay Area, but aims to study the reasons for the delay and withdrawal of doctoral students in Guangdong, Hong Kong (China) and Macau (China). Therefore, the root theory proposed by Strauss and Corbin is adopted as the research method.

In order to facilitate the demonstration, semi-structured one-on-one interviews were conducted with the samples. Due to the impact of COVID-19, the samples from Hong Kong (China) were interviewed online via wechat. First of all, we determine the relevant contents of the postponement of doctoral students, including semi-structured and open questions. After evaluating the relevant questions, exploratory questions are carried out in order to obtain further clarification or evidence from the interviewees. Secondly, considering the particularity of the delay and withdrawal of doctoral students, we first selected an ideal respondent introduced by a friend, and conducted the first exploratory interview in mid-November 2020 according to the personal wishes of the interviewees. The interview was held in a cafe near B University in the university town of Guangzhou. First, the middleman introduced the purpose of the study, and signed relevant confidentiality agreements with the interviewees. In the early stage, he established a harmonious personal relationship with the interviewees through the friendly communication, and conducted a long targeted interview for about 40 minutes.

The first interview provided me with some experience and improved the relevant questions in the interview. For example, how to avoid the embarrassment of the interviewees, ask questions in a more friendly way, how to grasp the interview process, how to ask in-depth inquiry questions and so on.

3.2 Participants

After the first interview, the validity and reliability of the grounded theory in the study were determined, and the interview scope was initially expanded. Using theoretical sampling, specific interviewees were selected at the initial stage of the study, and we searched for delayed withdrawal samples of doctoral students in 3 universities in Guangdong, Hong Kong (China) and Macau (China). Subsequently, semi-structured interviews were conducted on the target samples. A total of 14 doctoral students in 3 places were interviewed (including 3 retired students and 11 deferred students), and the interview was completed after the data theory was saturated. The demographic characteristics of the respondents are shown in Table 3.

Table 3: The demographic characteristics of the respondents

Respondent No	Age	Sex	Deferred time or clearance	Family relation	Regional university
1	35	man	An extension of one year	married	Guangdong A big
2	34	woman	An extension of 2 years	married	Guangdong A big
3	29	woman	An extension of 2 years	unmarried	Hong Kong (China) B big
4	40	woman	check and return	married	Guangdong A big
5	43	man	check and return	married	Hong Kong (China) B big
6	38	man	An extension of 2 years	married	Macau (China) C big
7	38	man	An extension of 2 years	married	Guangdong A big
8	44	man	An extension of one year	married	Macau (China) C big
9	28	man	An extension of 3 years	married	Macau (China) C big
10	37	woman	An extension of one year	married	Guangdong A big
11	36	woman	An extension of one year	unmarried	Hong Kong (China) B big
12	44	man	check and return	married	Macau (China) C big
13	45	man	An extension of 2 years	married	Guangdong A big
14	40	woman	An extension of 2 years	married	Guangdong A big

3.3 Ethical instructions

Prior to the interview, each respondent was informed about the purpose of the study and whether recordings were allowed, taking approximately half an hour per person. The interviews were entirely voluntary and can refuse to answer questions or drop the interview. We sign a confidentiality agreement for each respondent, and the privacy information such as the name, unit, reason for the extension will be anonymous in the study.

3.4 Data collection and analysis

From mid-November 2022 to mid-December 2023, the interviews were completed, and the interview lasted mostly 30 to 40 minutes, and all recordings were made. After that, each recording was numbered, and a total of 552 minutes were collected from 14 target samples.

The software is used to transform the recording of the interviewees into text. Through the comparison method, the common words, phrases and concepts in the interview will be compared. If the recording is ambiguous, the interviewees will pay a second brief visit to ensure the accuracy of

the information collected.

The process of analyzing the data consists of three levels of encoding. Categories, subcategories, and codes are shown in Table 4.

Table 4: Shows the categories, subcategories, and code table

Class	Subcategory	Code
Policy factors	The scale of doctoral is expanded, and the policy strictly controls the quality of doctoral graduates	1 The state clearly stipulates that the students who exceed the training period will be resolutely expelled.
		2 strict in and strict out of the social atmosphere
		3 The scale of doctors expands, and the ratio of teachers to students is unbalanced
Personal factors	Subjective and objective factors	1 The purpose of the exam, no estimate of scientific research career
		2 Lack of scientific research capacity
		3 No interest in scientific research or my major
		4 Family factors are troubled
		5 Excessive financial pressure
		6 Older age
		7 Lack of motivation to promote graduation
		8 Doctor career planning is unreasonable (loose and tight)
		9 Graduation thesis is very difficult
		10 Limit set before graduation (publication)
		11 In-service PhD study, work and scientific research mutual interference
Mentor factor	The responsibility of the supervisor is not fully fulfilled	1 The academic focus is not on guiding students
		2 Insufficient guidance level
		3 Tutors lead too many students, students than teachers
		4 The tutor is busy with his work and communicates less frequently
		5 The tutor project team lacks the topics, and the research is empty
		6 The project needs to be extended to graduate
		7 The doctor is used as a cheap labor force
		8 Key nodes have no guidance
		9 Tutors raise higher graduation requirements
		10 Mentors have too much power, and they have such a lack of constraints

Continued Table 4: shows the categories, subcategories, and code table

Class	Subcategory	Code
Cultivate unit factors	Lack of management, system and supervision	1 The management system is not detailed
		2 The policy is broad and cannot be implemented
		3 The implementation of the system is not strict, such as changing mentors
		4 Supervision and management is not transparent

4. Analysis of delayed doctoral withdrawal in Guangdong, Hong Kong (China) and Macau (China)

4.1 Policy factors

The delay of doctoral students in Chinese mainland is greatly affected by the policy, which mainly involves the policy of "strict entry and strict exit" and the expansion of the enrollment.

4.1.1 Education authorities shall strictly control the quality of doctoral students

Before 2010, there were few news that graduate students, especially doctoral students, were expelled. The news of withdrawing doctoral students occurred earlier in 2010, when Huazhong University of Science and Technology expelled 307 overtime graduate students. With the Opinions of the Academic Degrees Committee of The State Council, the Ministry of Education on Strengthening the Quality Assurance and Supervision System of Academic Degree and Graduate Education in 2014, Mention of "improving the quality of post-graduate education, Now to strengthen the degree and graduate education quality assurance and supervision system construction" requirements; In 2017, the Ministry of Education issued the 41 order "Regulations on the Management of Students in Regular Institutions of Higher Learning" Article 30 stipulates that "the school may drop out of school to deal with students whose academic performance does not meet the requirements of the school or fail to complete their studies within the years stipulated by the school"; In February 2019, the General Office of the Ministry of Education issued the Notice on Further Standardizing and Strengthening the Management of Graduate Training, Schools are required to strengthen the management of postgraduate training process and academic assessment. Its purpose is to realize the strict entry and exit of colleges and universities, to ensure that the talent training work is implemented. In 2020, the Opinions of the Ministry of Education on Further Strictly Regulating the Quality Management of Degrees and Graduate Education these documents have been issued successively, requiring training units to ensure the quality of doctoral students and provide policy support for the large-scale extension and withdrawal of doctoral students, which is the social reason for the delay of the withdrawal of doctoral students.

4.1.2 Continuous expansion of enrollment

In order to meet the demand for high-end talents in the rapid development of the country, the enrollment scale of doctoral students in China continues to grow. In the past five years, the average annual enrollment of doctoral students has increased by about 8% per year. See Table 5 for details. However, the corresponding supporting conditions do not increase synchronously, such as the number of tutors, laboratories, laboratory equipment, etc., which is bound to lead to the decline of the quality of doctoral training, and affect the graduation on time.

Table 5: Table of the 5-year doctoral enrollment in the mainland

A particular year	2018	2019	2020	2021	2022
Number of doctoral students	93802	103448	116047	125823	138951

Note: Data source is the collation of statistical data for 2018-2022 by the Ministry of Education

4.2 Its own factors

Cobo's motivation, part-time job fair lead to delay and withdrawal, financial pressure, and other factors lead to delay and withdrawal

4.3 Mentor factors

In the cultivation of doctoral students, the relationship between the supervisor and the doctoral students is the most basic and the most important relationship. It has been mentioned in studies at home and abroad that the supervisor guidance of doctoral Li Xia is positively correlated with the professional level and guidance relationship of doctoral students. In the interview, four questions involving the tutor factors were analyzed.

4.3.1 The tutor is busy and communicates less frequently

In the doctoral learning stage, some doctoral students do not have a good understanding of their research direction and methods, and many situations require the guidance of tutors. If the supervisors can effectively give guidance, doctoral students can quickly find the research direction, efficiently carry out doctoral learning, and effectively avoid delay and withdrawal. No.12 "the tutor is the industry, most of the time, the guidance is busy reporting, the time is very limited, basically in the stocking state, sometimes want to communicate to the tutor, the tutor is working in the field"; No.7 "my tutor and I agreed to report the research results once a month, the result is now half a year, the teacher does not care also let me slowly relax the research"; No.9 "my tutor has an administrative position, often meetings, the original communication time is also blocked by various meetings, no convention".

4.3.2 The supervisor leads too many doctoral students, and the student-teacher ratio is bigger

A supervisor's time and energy are always limited. He should not only do his job well, but also guide doctoral students. If doctoral supervisors lead too many students, each person will have less time receiving guidance, which will affect his graduation. After investigation, in recent years, colleges and universities have been expanding the enrollment in the recent 5 years, and the ratio is about 23:1. For details, see table 6 for the ratio of domestic doctoral students in the recent 5 years.

Table 6: The comparison table of doctoral students in the recent five years

A particular year	2018	2019	2020	2021	2022
Number of doctoral students in school	382604	416856	466549	509453	556065
Number of doctoral supervisors	17286	17264	19854	11769	13545
Student division than	22:1	24:1	23:1	43:1	41:1

Note: Data source is the collation of statistical data for 2018-2022 by the Ministry of Education

No.8: "my doctoral guide with this have 2 doctors, teachers in school have 10 doctors, there are 4 deferred, the tutor can not take care of us"; No.9: "the mentor is the head of the research group, our group has 9 people, my research direction is determined, in many cases, is experienced brother in guiding me" number 10 "we are famous schools, tutor with more students, now a total of 22 people, tutor sometimes busy".

4.3.3 The tutor puts forward higher graduation requirements

Most of the domestic doctoral supervisors are well-known experts in the industry, and most of them hold administrative positions. In order to achieve their own academic reputation, these doctoral supervisors put forward higher requirements for doctoral students. No.1: "our graduate

school required graduation standard, department is a standard, tutor and add graduation standard is higher, the name of the school and tutor" are embarrassed: "no. 7:" mentor fame is now a burden for me, don't want to let others say so-and-so academic papers on this level, so a good article has not contributed, now the school required papers or 0, which also let me delay, if no results, liquidation is inevitable result " graduation standard is not unified, to the fairness of doctoral degree, also have a certain impact on the relationship between teachers and students.

4.3.4 Docs are used as cheap labor

Some subjects have a long project cycle. In order to complete the project smoothly, the tutors will sometimes retain excellent doctoral students to continue their doctoral studies and graduate after the completion of the project. No.7: "I have been postponed for 2 years, mainly the project with the teacher has not been completed, I have reached the graduation conditions, the tutor want me to let me graduate, I can not delay"; No.9: "tutor busy, sometimes let us do some scientific research irrelevant work, my English is better, sometimes to tutor the third school children English, can not refuse, the tutor does not mention pay"; No.13 "sometimes help the tutor to take express and reimbursement, but do not want to relationship with the tutor". In the eyes of doctoral students, the positive support of the supervisor is especially reliable, confident, inspiring, knowledgeable, informative and sharing, which provide a strong motivation for doctoral students.

4.4 Training unit factors

4.4.1 Insufficient process supervision

In domestic general graduate school management, tutor responsibility system, graduate school is only responsible for the students enrollment, opening, graduation and other procedural quality supervision, doctoral training all doctoral supervisor is responsible for, in the interview of 14 Dr 13 students did not feel the supervision of graduate school, especially the supervision of doctoral supervisor and training college.

4.4.2 The system implementation and operation is difficult

Many doctoral training programs in Chinese mainland, Hong Kong (China) and Macau (China) also involve the exchange of doctoral supervisors for various reasons. In fact, it is often difficult to operate at present. No.4: "Because I do not know the research direction of my tutor, I wanted to apply to change the tutor from the graduate school. However, because the tutor is also the leader of the school, the graduate school persuaded me many times and told me about the bad effects after the change, so I did not change the tutor until I was removed".

5. Hong Kong (China) and Macau (China) to avoid the delay of doctoral student withdrawal strategy for reference

As is well known, the overall quality of universities in Hong Kong (China) is higher than that in Guangdong. Although universities in Macau (China) are small in scale and low in starting point, their development speed is fast. Some strategies of training doctoral students in Hong Kong (China) and Macau (China) are worth reference.

In the data survey, it was found that the delayed withdrawal rate of doctoral students in Hong Kong (China) and Macau (China) was low. The on-time graduation rate is significantly higher than that in the mainland. Taking B University of Hong Kong (China) as an example, the on-time graduation of doctoral students in the past five years is shown Table 7, and the average graduation

on time is as high as 83%.

Table 7: Graduation of Hong Kong (China) B doctoral students in the past 5 years

A particular year	2018	2019	2020	2021	2022
The number of doctoral students should graduate	103	105	106	107	109
The actual number of doctoral student graduates	79	91	91	91	88
Doctoral students' on-time graduation rate	74%	83%	83%	88%	88%

Note: Data source B big official website collation

C University, despite a small enrollment scale, has developed rapidly in recent years, with the average on-time graduation rate reaching 61%.As shown in Table 8.

Table 8: Graduation status of doctoral students from C University of Macau (China) in the past 5 years

A particular year	2018	2019	2020	2021	2022
The number of doctoral students should graduate	119	126	111	180	224
The actual number of doctoral student graduates	57	66	63	142	151
Doctoral students' on-time graduation rate	48%	52%	57%	79%	67%

Note: Data source of Macau (China) Higher Education Bureau website collation

Because did not find Guangdong A school graduation data, unable to calculate the A calibration when graduation rate, domestic literature points out that Dr The university delay repel and regional difference is small, so through the Guangdong overall to illustrate A school, nearly five years doctoral graduate below table 9, you can see that our doctoral graduate rate on time is about 40%, far lower than the Hong Kong (China) and Macau (China) sample university graduation rate on time.

Table 9: Table of doctoral students in Guangdong Province in the past 5 years

The number of doctoral students should graduate	7132	7406	7664	7726	8360
The actual number of doctoral student graduates	2947	2940	3047	3110	3075
Doctoral students' on-time graduation rate	41%	40%	40%	40%	37%

Note: Data source of 2015-2019 by the Ministry of Education

After the analysis of the training policies and systems of doctoral students in the sample universities of Hong Kong (China) and Macau (China), the universities in Hong Kong (China) and Macau (China) mainly start from three aspects: "guidance", "assistance" and "promotion". In view of the shortage of universities in Guangdong, the strategy of reducing the rate of extension and withdrawal of doctoral students is proposed.

5.1 Improve the guidance system

5.1.1 International first-class curriculum system

Doctoral student courses in universities in Hong Kong (China) and Macau (China) are mostly

taught in English. The original textbooks of developed countries have a large proportion, and the curriculum setting and curriculum content are synchronized with those of developed countries in Europe and the United States.

5.1.2 Reasonable student-teacher ratio and various ways of guidance

With the expansion of the enrollment scale in the mainland, the ratio of students to teachers in the mainland has been getting larger. In contrast, the enrollment scale of Hong Kong (China) and Macau (China) is stable, and the enrollment limit is set for doctoral supervisors, and the ratio of students to teachers is lower than 10:1. In addition to the common single tutor system, the system can also adopt dual tutor system, multi-tutor system or steering committee system to help doctoral students expand their academic thinking and innovation ability from different perspectives.

Secondly, the quality of supervisors recruits a large number of outstanding teachers from mainland and international, and invites top scholars and scientists to cooperate, which helps to improve the graduation rate of doctoral students.

5.2 A comprehensive student aid system

5.2.1 High grants

The primary task of doctoral students is to do scientific research and form innovative results, which requires doctoral students to be undistracted and not disturb scientific research due to financial problems, but the fact is often the opposite. Hong Kong (China) and Macau (China) region to solve this problem, large increase grants amount, such as Hong Kong (China) B big monthly bonus hk \$24000, Macau (China) C scholarship 20000 A month, by contrast, Guangdong A big 4000 yuan A month grants too little, A students to meet the needs of life, will do teaching assistant, tube, research work, invested A lot of time cost. High subsidies can not only guarantee a safe personal life, but also sometimes subsidize the family and avoid family disputes, which can create a good external environment for research. It is suggested that the mainland, especially Guangdong, should also refer to the practice of universities in Hong Kong (China), Macau (China), Hong Kong (China) and Macau (China), and attract outstanding doctoral students from world-famous universities through high scholarships and increased grants, so that they can devote themselves to scientific research.

5.2.2 Provide an international exchange platform

The platform is a research stage for doctoral students, which helps students to carry out scientific research work. Universities in Hong Kong (China) and Macau (China) provide a sufficient international exchange platform for doctoral students. PhD students can broaden their horizons and carry out research with international cutting-edge theories and technologies, which has more advantages than simple closed-door research. For example, the EU Academic Program (EUAP) of Hong Kong (China) B University expands academic exchanges with the EU through academic activities and helps train doctoral students. In addition, universities in Hong Kong (China) and Macau (China) recruit a large number of professors from overseas world-class universities, which can not only effectively improve the quality of scientific research, but also help to establish transnational cooperation relations.

5.3 Diversified methods to promote learning

5.3.1 Peer learning

The doctoral research in sample universities in Hong Kong (China) and Macau (China) is carried out through projects, with 3-15 students in the same project team. The team members often communicate about scientific research and study, and a good competitive environment is formed through peer learning. The learning effect and ability of peers are a kind of pressure on themselves and promote their own learning. Participating in team projects and having the opportunity to work in research with more experienced researchers, these groups provided not only the opportunity to learn together but also provide feedback to each other.

5.3.2 Standardize the high-quality graduation requirements

Hong Kong (China) universities in Hong Kong (China) have a high international reputation, which stems from the control of the quality of doctoral training, which focuses on process supervision. For example, students must submit research reports within the specified time period. After passing their doctoral candidacy, students must submit their progress report annually until they submit the final version of the paper and complete a rigorous defense.

5.3.3 The deferred doctoral payment system

Compared with the Chinese mainland, universities in Hong Kong (China) and Macau (China) still charge a certain fee for the delayed graduates, the amount of this fee is generally charged according to the proportion of tuition fees, which requires doctoral students to complete their studies as soon as possible, and to some extent, promote doctoral students to complete their graduation thesis in time.

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