

Discussion on the reform of postgraduate education and tutor system in ordinary undergraduate colleges

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Abstract—More and more undergraduate colleges and universities have obtained the right to grant master's degree with the development of postgraduate education in China's colleges and universities. However, since the ordinary undergraduate college has obtained the qualification for master degree just a few years, shortcomings are occurred in the training and supervisor systems. In order to improve the quality of postgraduate training in ordinary undergraduate colleges, this paper has detailed the characteristics of postgraduate training in ordinary undergraduate colleges and carried out discussions on the improvement of training and tutor system. A survey has been conducted to comprehend the current postgraduate training process from the aspects of master students and the tutors. Some problems are identified and some suggestions are given to strength the education quality for master students.

Keywords—Ordinary undergraduate college, postgraduate training, postgraduate supervisor

I. INTRODUCTION

As the top of the national education system, postgraduate education is significance to cultivate high-level specialized talents, an important pillar of national talent competition, and also the core element of building an innovative country [1,10]. In addition, master students are high-level talents in a country, which is also the main force to be cultivated to the researchers for a country. The quantity and quality of postgraduate training is a powerful guarantee for a country's high-speed and high-quality development. With the rapid development of China's economy, the demand for graduate students has been increasing, and the scale of graduate students in China has also expanded year by year. According to the official statistics[11], by 2016, Chinese higher education system consisted of over 2,596 regular (academically oriented) colleges and universities, and 284 adult higher education institutions. Among the regular higher education institutions, 1,237 are ordinary undergraduate colleges. There are 793 postgraduate training institutions in the country, including 576 general colleges and 217 scientific research institutions. In 2016, China had a total postsecondary education enrollments of over 1.98 million (In 2018, the total number is 2.73), including 0.34 million students in the study of doctoral level and 1.64 million were enrolled master degrees. In 2017, the number of postgraduate students reached 2.639 million, with 578,000 graduates. China has become a graduate education and training country. However, more and more opinions are emerged that the

quality of graduate students is declining year by year with the repaid increasing number of master students.

In China, mentoring is a fundamental system in postgraduate training process, which is also known as the Tutor System, that is a "mentor for graduate students in all aspects of learning, research, and moral life individual guidance and overall responsibility of teaching management system" [2]. It can be said that the tutor is the "guardian" for the master students. In the process of cultivating graduate students, the tutors undoubtedly play crucial role. The tutor is closely related with the progress of master students. Therefore, the reform and improvement of the tutor system is the fundamental guarantee for the quality of postgraduate training. With the expanding number of students, the improvement of professionalism education should be established. In order to make the cultivating mode of specialized master education more scientific, reasonable and orderly, Wenfei Hu etc.[7] has introduced the '1-3-3-4 Cultivating Mode' to specialize master reform. Guangdong Wu etc. [8] proposed a CDIO engineering education system and the implementation guarantee mechanism based on complex learning theory. As for the master education of engineering management, a relatively complete education system is formed based on the combination of complex learning theory and CDIO educational philosophy. The evolution and maturation of the cybersecurity discipline is reviewed by Cabaj Krzysztof et al. [9]. The contents of courses, structure, admission requirements, duration, requirements for completion, and evolution are analyzed for top universities.

There are already the other research works related to postgraduate training in colleges and universities [2-8], but there is no analysis of postgraduate training specifically for the characteristics of ordinary undergraduate colleges. Different with existing works, this paper analyzes the problems existing in the postgraduate training process of ordinary colleges and universities, discusses some further improvements of the tutor system, and puts forward some suggestions for further improvement of the postgraduate training quality in ordinary undergraduate colleges.

Firstly, in addition to the commonality of the postgraduate training process in all colleges and universities, the postgraduate training in ordinary undergraduate colleges has its own characteristics compared with the key universities. Ordinary undergraduate colleges are usually granted later for master's granting rights, which lead to lack

of experience in postgraduate training. The tutor's assessment system is relatively imperfect, and the quality of students is relatively poor.

Secondly, due to the long period of enrollment of graduate students for key universities, the graduate admission, training and tutor assessment systems are relatively more perfect. However, a large number of master's degree programs in ordinary universities are qualifications in the past 15 years. There is no experience in many aspects of postgraduate training, and the quality of students is often relatively poor. Therefore, there are many problems that affect the quality of graduate education.

Thirdly, the factors including social awareness, student characteristics, research funds, the system construction, and

the length of training are closely related to the quality of postgraduate education. Compared with traditional key universities, ordinary undergraduate colleges have unique characteristics in these factors, so there are some differences in the main problems faced in the postgraduate training process.

Table I compares the main influencing factors of postgraduate training in ordinary undergraduate colleges and traditional key universities. It can be seen that the postgraduate training prerequisites of ordinary undergraduate colleges and traditional key colleges are different, which leads to problems and difficulties in the postgraduate training process of ordinary undergraduate colleges.

TABLE I. KEY INFLUENCE FACTORS BETWEEN ORDINARY UNDERGRADUATE COLLEGES AND TRADITIONAL KEY UNIVERSITIES

	<i>Reputation</i>	<i>Research topic</i>	<i>Training time</i>	<i>Source of students</i>	<i>System Construction</i>
Traditional key universities	High	Research topics are widely sourced and the project funds are adequate	Experienced and long-term authorization	A high proportion of volunteers, better candidates based on independent and strong graduate study	Postgraduate training, scholarship selection, tutor evaluation and other systems are relatively perfect
Ordinary undergraduate colleges	Low	The research project has a narrow source and the project funding is relatively insufficient.	Short authorization time and relatively lack of experience	The ratio of one volunteer is low, the foundation of candidates is poor, and the autonomy of graduate students is poor.	Graduate training, bursary, teacher evaluation system is relatively imperfect, etc.

II. PROBLEMS ANALYSIS IN THE CURRENT POSTGRADUATE TRAINING PROCESS

A. Graduate students' own problems

a) The goal of graduate study analysis

At present, the purpose of postgraduate study is diversified. Except for a few number of graduate students who are pursuing academic research ideals, many graduate students do not aim at academic research. Some students just simply want to take a master's degree, and some just want to escape to find a job. Graduate students in ordinary undergraduate colleges of this situation is particularly serious. This paper has investigated the graduate students of Software Engineering College of Chengdu University of Information Engineering(CUIT). The three years study targets of master students are shown in Fig.1. Based on this figure, the major students aim to meet the college's graduate requirements and find a job after three years study.

Also, the major part of graduate students often lacks the initiative to learn during their studies, research independence is very poor, and the students still maintain the undergraduate study thinking. It is very difficult to independently complete the scientific research tasks assigned by the tutor and the learning results are also relatively low.

b) Tutor's guidance recommendation acceptance analysis

Graduate tutors tend to engage in academic research for many years and have their own unique insights in the academic field. In the process of leading graduate students, they usually recommend graduate students to choose the research direction according to their own research fields, the

understanding of the development of research directions, and the characteristics of graduate students. The survey has shown that 37% of students are dissatisfied with the research direction that determined by the tutor.

Some graduate students tend to pursue research hotspots and popular directions, and even in total disregard of research and recommendations from the good mentors. In this case, some moderate instructors will let these graduate students choose the direction that they like, and yet, it is very difficult to guide the scientific research since the tutors will not have enough strength. Other rigorous instructors will ask graduate students to pursue their own research directions, but these graduate students cannot focus on their own research direction, and ultimately affect their own academic study. The new enrollment graduates are often superficial in the research field and industry development. However, the tutor has been deeply immersed in research fields for many years, and has a deeper understanding of the research field and the related industry development, and the vision is more profound. In the choice of research direction, the master students should actively discuss with the tutor and listen to the advice of the tutor.

c) Focusing on "money", the mind of treating the tutor's allowance is not correct

The master tutors usually have vertical or horizontal projects. In the process of leading graduate students to complete the project, the subsidy will be given to the graduate students. This is an additional benefit that graduate students can get while learning, but it leads to some students' incorrect attitude. The survey has shown that 100% of students want the tutors have projects. Among them, two-thirds of students want the tutor has vertical projects and one-third want the tutor has horizontal projects.

Some of the students did not hold the idea that their instructors' willing to conduct hard work to guide themselves to learn and grow, and yet believe that he was working as a worker instead. They also give their tutors the title of "boss". Some graduate students even have negative attitude because of the amount of allowances. They think that they work hard and the tutors donate very little, so they passively study the subject. Even some students think that doing research, finishing the programming of algorithm, and writing papers are all the work given by the "boss". Due to this incorrect attitude, some graduate students even go to "private work" to earn money and negatively treat the research topics of the tutor. Some students are also negative in the process of completing the research, ultimately, this attitude is harmful to the students' own studies.

A survey has been conducted to know the main problems in the process of master learning and doing research work and obtain the abilities that the master students want to have after three years study. The results are shown in Fig.2. Based on the results, it is recommended to set up special courses for postgraduate admissions to help graduate students understand what research is, the importance of tutor suggestions, three-year goal planning, etc., and help graduate students to correctly understand the relationship between research and research grants. For the graduate students who are not interested in academic ideals, they will give correct and patient guidance through this course, let them re-establish academic aspirational goals, carefully plan their three-year learning goals, and thus improve the quality of master education.

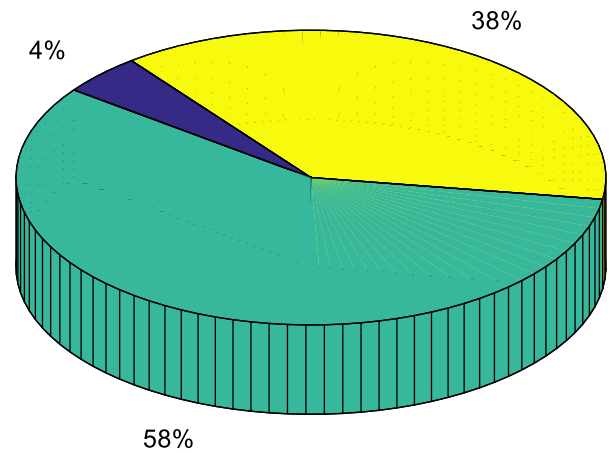
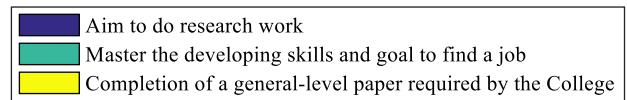


Fig. 1. Three-year study target analysis for master students

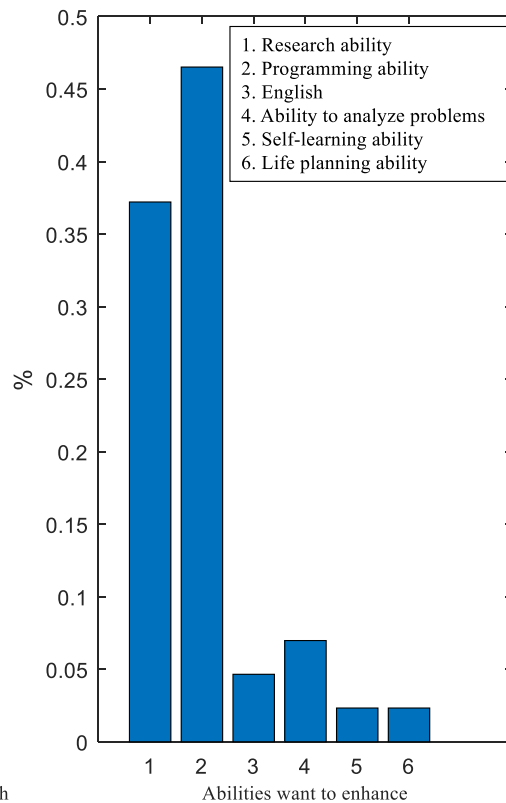
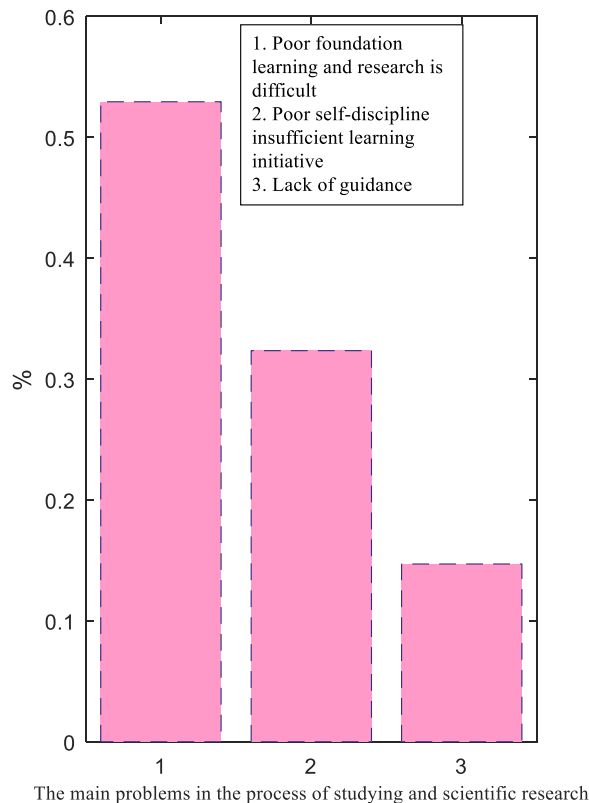


Fig. 2. Current master education status analysis

B. Problems analysis with the Tutors

a) "Earning money", using master students as a worker

Some of the instructors come from companies with more horizontal projects. Some of the instructors even have their own companies. In the process of guiding master students, they focus on their own projects and treat graduate students as cheaper labors. Some of them didn't consider actively guidance from the perspective of research development.

The Ministry of Education issued the "Opinions on the Full Implementation of the Duties of Graduate Tutors", stating that the instructors should have a sense of responsibility and mission, do their due diligence, and ensure that sufficient time and energy to guide master students.

b) Stocking status, regardless of students

Postgraduate training and undergraduate training methods are different. The tutor mainly guides the research direction, inspires ideas, and discusses them in some important links. The main research processes such as reading papers, experiments, and innovations should be completed by graduate students themselves. That is to say, the tutor does not need detailed guidance throughout the whole process. This is the characteristics of the postgraduate training itself, which is an "extensive" guidance. But this does not mean that graduate students do not need guidance and do not need to discuss research issues with the instructor. Most graduate tutors are responsible for the cultivation of graduate students, and they are constantly considering and improving their research ability. However, some of the tutors have a poor sense of responsibility. They often use the reasons of busy work or poor graduates' foundations to put graduate students in a "stocking" state. In the "Opinions on the Full Implementation of the Duties of Graduate Tutors", the instructors should "follow the rules of postgraduate education, innovate postgraduate guidance, devote themselves to postgraduate training, educate people in all processes, educate people in all aspects, and become a mentor of graduate students." The instructor has an unshirkable responsibility for the postgraduate study. He should try his best to guide the postgraduate students and try their best to make the graduate students achieve success in three years. This is the basic professional conduct of teachers.

In fact, many laboratories have a tradition of regular academic seminars. Generally, graduate academic seminars are held once a week for one to two weeks. Usually, one or two graduate students explain their own research topics, and then other graduate students and tutors discuss together. During the discussion, we will expand the subject of learning in the field of specialization, help graduate students sort out ideas and improve their understanding of the subject. Based on the survey, in software engineering college of CUIT, 77% tutors will hold the academic seminar once a week, 13% twice a week, and 10% once a month.

III. SOME SUGGESTIONS FOR IMPROVING THE MENTOR SYSTEM

As we all know, in the postgraduate training system of tutor system, the tutor plays a vital role in the postgraduate training process. The quality of postgraduate training depends not only on the quality of the tutor's scientific research, but also closely related to the responsibility of the

instructor. In view of the tutor importance, in postgraduate training, the tutor system needs constant reform and improvement, establishes a supervision mechanism, and eliminates those teachers who lack of enthusiasm and responsibility. Through the improvement of the system, the management of the postgraduate training process will be strengthened, the quality of postgraduate training will be improved, and qualified high-level talents will be provided for the country's construction and development.

A. Lower the qualification to be a instructor and establish a dynamic exit mechanism for the instructor

The qualifications of graduate tutors are mostly linked to professional titles. Generally, they are required to have the qualifications of associate professors or higher to apply for graduate tutors. However, in fact, some young teachers who are energetic, have academic ideals and strong scientific research ability. They even have higher-level subjects. They urgently need graduate students to work together. However, they didn't have a professional title and could not apply for a postgraduate tutor qualification.

In addition, the qualifications of graduate tutors should not only focus on the qualification assessment of admission, but should also establish a dynamic assessment mechanism for the position of tutors. The instructor will be re-evaluated from the aspects of teacher morality, tutor scientific research performance, and postgraduate training quality. The tutor who does not meet the requirements will be disqualified from the tutor, thus ensuring a high-quality tutor team and ensuring the quality of postgraduate training.

B. Strengthen the management of postgraduate training process and increase the quality evaluation index of postgraduate training

In the process of postgraduate training, colleges and universities should not rely too much on the tutors. It is also necessary to strengthen the supervision and management of the education process. For example, an online anonymous assessment can be conducted once a year, and then the relevant opinions can be feedback to the tutor in timely. A recorded academic discussion meeting can be conducted once a month to strengthen the supervision of the postgraduate training process.

Nowadays, many colleges and universities have already implemented a dynamic assessment mechanism for tutors, but most of them only evaluate the research funding and scientific research performance of the tutors. Few examinations are devoted to the quality of postgraduate training. It is recommended that in assessment process should also consider the published paper qualities, employment quality, graduation qualities, and anonymous evaluation indicators into the scope of assessment.

C. Reduce the administrative intervention and formulate a two-way selection system for tutors and students

Most college graduate admissions courses adhere to the concept of academic autonomy. The two-way selection system is implemented, that is, graduate students are free to choose tutors, and the tutors select graduate students according to the candidates. This two-way selection system has a good scientific nature. Before choosing a tutor, graduate students usually inquire about the situation of the

tutor via various channels, so that they can have a certain understanding of the tutor's scientific research direction, scientific research ability, and guiding students' situation. This approach is similar to the market economy. Candidates will naturally tend to apply for excellent tutors with good morality, strong scientific research, adequate research funding, and effective student guidance. These excellent tutors can also choose from more candidates.

However, many colleges and universities have devolved the postgraduate's right to the secondary colleges, resulting secondary colleges intervene the graduate admissions and abandon the concept of academic autonomy to reflect the distinctive administrative rights. This is especially evident in ordinary undergraduate colleges and universities. The authors investigate that in two ordinary colleges, there is a secondary college distribute the graduate student based on the rules of administrative rights. A second-level college is unified distribution of candidates after the unified admission, based on the rules that first meet the professor's admission indicators and then associate professors. Another college's second-level college adopt the team admission system, that is, candidates will only select the team, and then the team leader will finish the assignment of students. Both of these situations reflect the priority of administrative rights, rather than the priority of academic rights. The tutor has no right to choose, and graduate students also do not have the freedom to choose. The administrative rights are often given priority, and it is difficult to objectively consider the quality of the tutor's research and the effectiveness of students' guidance. The system should consider how to enforce the tutors do good jobs in research, guide graduate students effectively, and form a good effect. The authors argue that colleges and universities should fully reflect the concept of academic autonomy and reduce the process of administrative intervention during the process of postgraduate registration and admission. Let outstanding graduate tutors recruit excellent graduate students, and let those teachers who are lacking in morality and irresponsible, even if they pass the assessment, are naturally eliminated.

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APPENDIX: A SURVEY HAS BEEN CONDUCTED TO
COMPREHEND THE CURRENT POSTGRADUATE TRAINING
PROCESS

1. Which of the following schools are you from? ()
 - A. Top universities
 - B. ordinary undergraduate colleges
 - C. Three-type universities
 - D. Specialty
 - E. Others_____
2. Which of the following is your graduate admission score? ()
 - A. 0~10 above the cut-off line
 - B. 10~20 above the cut-off line
 - C. 20~30 above the cut-off line
 - D. 30 ~ 50 above the cut-off line
 - E. 50 + above the cut-off line
3. Have you passed the following English tests?
 - A. CET 4
 - B. CET 6
 - C. Failed CET 4
4. How well do you think you have mastered a computer development language? ()
 - A. Master
 - B. Skilled
 - C. Average
 - D. Not very familiar
5. What are your goals for three years? Multiple choice ()
 - A. Publish papers in SCI journals
 - B. Publish papers in EI journals
 - C. Publish papers in core journals
 - D. Master development skills
 - E. No special requirements
 - F. Just graduate
6. Which of the following would you like a mentor to help you with? ()
 - A. Provide horizontal projects to improve the ability of project development
 - B. Provide vertical research projects to improve the ability of scientific research
7. How often do you and your tutor discuss research or study? ()
 - A. Less than 3 days
 - B. Once a week
 - C. Once a 2 week
 - D. Once a 3 week
 - E. Once a month
 - F. The mentor doesn't care
8. Are you satisfied with the research direction assigned by your tutor? ()
 - A. Yes
 - B. No, but the research direction will be determined according to the opinion of the tutor
 - C. No, I have determined a research direction
9. What kind of work do you most want to do after graduation? ()
 - A. Government agencies
 - B. Research institutions
 - C. University
 - D. Well-known state-owned enterprises
 - E. Well-known IT company
10. What is the main purpose of your study? ()
 - A. I am interested in academic research and hope to improve my ability in this area.
 - B. I hope to improve my educational background
 - C. the work is hard to find and I choose to study first
 - D. Other_____
11. What are the main problems in your current study of scientific research? ()
 - A. I have a poor foundation and I am struggling to study
 - B. I have poor self-discipline and lack of initiative in learning
 - C. Lack of guidance from a mentor
12. What are you doing mainly now? ()
 - A. I am now a first year graduate student, mainly studying in class.
 - B. I am mainly completing the horizontal topic of the instructor and have no time to do research
 - C. I am mainly completing the research topics designated by the tutor and improving my research ability.
 - D. The instructor has no specific requirements
13. What skills do you want to improve during your studies? ()
14. What courses do you think are most necessary for the courses currently offered by the college? (), What courses do you want the college to offer? ()