Education Reform of Professional Degree Graduate for Mechanical Engineering Field

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Abstract. In view of the present situation of professional degree graduate student training in mechanical engineering field, the authors analyzed the existing problems of present education models, proposed the specific reform measures, revised the training plan, compressing the course time, and strengthened the course construction, teaching material construction and practice base construction. At the same time, the paper analyzed the current situation of teaching staff and the existing problems, put forward the concrete measures and suggestions to strengthen the construction of teacher's team, strengthened supervision and examination of the professional practice for students. After practice, a good effect was gained.

Introduction

Professional degree graduate and academic graduate students are the same level, but different types of graduate students. According to the National Engineering Master Major Degree Education Steering Committee, the training target for professional degree students is confirmed as the following: to develop a solid, quality comprehensive innovation ability and engineering practice ability and have a certain applied, composite high-level engineering and engineering management personnel [1].

According to the standard, Anhui University of Science and Technology made the training plan for professional degree graduate students in mechanical engineering field. But in the process of the plan implementation, many students did not in accordance with the training plan for professional practice, and this seriously affected the cultivation quality of the professional degree graduate. Therefore the education model must be reformed and the training plan must be revised.

Existing problems

The length of schooling for professional degree students is two years. The program is divided into the three links such as courses, professional practice and dissertation. Usually, courses are for one year, professional practice is at least for half a year. Courses and professional practice adopt credit system for quantitative assessment, and total credits required is not less than 38 credits. Among them, course link is not less than 28 credits, professional practice 10 credits. Because the courses time and the writing time of paper were almost fixed, the students either didn't go to professional practice, or shortened the practice time, thus the plan actually had not been enforced.

Professional practice is an important link of education system for the professional degree students. The main purpose of the professional practice is according to the characteristics of the field to go to the factories and mines enterprises for practice. Through the practice the students should be familiar basically with work process and related professional technical specifications, and further to improve their research and technology innovation ability. If there is no professional practice in accordance with requirements, we can't meet the standard requirements of training goal, and the students also cannot meet the requirements of the employment unit.
The measures taken

To revise training plan

The training plan for professional degree students must be revised according to the standard determined by the National Engineering Master Major Degree Education Steering Committee. The educational system for professional degree students is 2 years with a joint training mode by a school teacher and an off-campus mentor. The school teacher is responsible for the professional quality, and the off-campus mentor to participate the guidance of the work such as the practice process, project research and practice report and so on. And in 2 years of educational system, the plan revised must reasonably allocate courses time, practice time and paper writing time. Courses time must be controlled in about 30 weeks. Practice time must be at least half a year. For assessment of the practice, it should be assessed by credit system like course link. So in the plan revised, total credits required is not less than 33 credits. Course link is not less than 27 credits, and degree courses is not less than 16 credits. The professional practice is 4 credits, and practice assessment is 2 credits.

To strengthen the construction of teaching material

Pay attention to the applicability and practicality of the teaching material

The content and structure of the teaching materials must meet the requirements of training scheme, meet the requirements of teaching outline. The professional knowledge and ability structure of the post must be carefully designed, linking theory with practice, strengthening the operation and the training, bringing the application ability training of the students in the teaching material [2].

Pay attention to the advanced nature of the teaching material

The content of the teaching materials should not only reflect the internal logic of this discipline, but also reflect the external links with other disciplines, combining with the reality and reflecting the rapid development of science and technology and social progress [3].

Pay attention to the systematisms of the teaching material

In the process of writing, we can not only think one course in isolation. We must carry on the overall optimization, and pay attention to deal with other courses. At the same time, the content and structure of the teaching material must be a complete system, with the proper depth and breadth.

To improve examination of the professional practice

Professional practice is important for the professional degree graduate. Through the professional practice the students can know well the work process and related professional technical specifications. Combined with practical contents they can finish their paper work. However, because the original program was not reasonable, and almost all the students were not the professional practice. They either didn't go to professional practice, or shortened the time required for professional practice, and this seriously affected the professional practice. After the reform, courses time is compressed by almost 35%, and the students have enough time to arrange practice.

Professional practice can be flexible in several ways.
(1) To arrange students to professional practice combined with school teacher’s scientific research subject.
(2) To arrange students to professional practice combined with off-campus mentor's scientific research resources.
(3) To arrange students to professional practice by students themselves combined with their career.
(4) To arrange students to professional practice by the industry-university-research cooperation base.

No matter what form is adopted to improve the professional practice, a mentor must be equipped with on-site guidance and urging students to professional practice. The students must write daily practice log. After the professional practice, the students should write no less than 5000 words of professional practice summary report, and fill in “Anhui University of Science and Technology professional graduate student professional practice examination registration form”.

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School should organize the symposium made up of experts in and around our school and heads of the unit to participate in the professional practice. The students report the professional practice work, the commission of the symposium should evaluate the results as four rating scores "excellent, good, pass and fail" according to the graduate student's practical work, a practical unit feedback integrated performance, report content quality, etc. The students who passed the exam will obtain 2 credits, and one get non-credit who didn't pass the exam.

The students who didn’t participate in professional practice or didn’t pass the practice examination will not apply for graduation and dissertation.

To strengthen the construction of teaching staff
Building an innovation-oriented country needs to cultivate a large number of various types, various levels, different features innovative talents in various industries to satisfy the needs of the scientific development of the new situation. And this puts forward higher request for higher education. So institutions of higher learning must further strengthen the construction of teachers team, control teachers' access system, improve teachers' teaching ability, lead teachers to deepen teaching reform, adapt to the demands of high-quality innovative talents. And for professional degree students, teachers should pay more attention to practical ability and practical skills training. This kind of vocational training needs professional teacher guidance [4].

To strengthen the construction of practice base
Practice base is a comprehensive functions body which is build by the schools and the practice units based on the contract agreement for promoting common development of colleges, students and practice units, integrating teaching, scientific research, production and education [5]. Practice base is the long-term stability of the place. And it should enable the students to have a purposed, planned and organized to participate in professional practice, so as to improve the students’ professional ability. Practice base construction is very important to improve the quality of the professional degree students. It is directly related to the quality and effect of the professional graduate student training. It is an important link of the personnel training goals [6]. But how to build practice base? It is a question to the schools and the practice units.

(1) The schools should develop a long-term, scientific practice base construction and development planning combining national education development strategy of full-time professional degree students [7].

(2) The schools and the practice units should build a industry-university-research cooperation mechanism with win-win cooperation.

(3) The schools should choose the enterprise as the practice base whose major and specifics are relatively in line with the school yourself. The enterprise in the field of industry also has some advanced and representative, its management operation mechanism is relatively smooth [8].

(4) Enterprise has cooperation motivation to participate in university-enterprise cooperation of cultivating engineering master's.

Summary
Combining with the problems existing in implementation process of the training plan for professional degree graduate student in mechanical engineering field, the revised plan reduced course credits from 28 to 27, and reduced some course time. So we can arrange the courses in one semester courses time, not more than 1.5 semester. On the other hand, the revised plan adjusted the professional practice credits from 10 to 4, increased practice assessment credits 2. After practice we achieved certain results, but this was just the first step in the reform. In the future, we will strengthen the construction of laboratory in school, improve the effect of professional practice, and try our best to improve our professional degree graduate student teaching quality.
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References


