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Investigation and study on the production practice of engineering college students

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Abstract: Production practice is an important way for college students to get in touch with society, test what they have learned in school and improve their comprehensive quality in practice, and it is also the beginning of their future career. With the constant change of employment situation, the process of production practice has also become an important reference factor for enterprises to select talents. How to build a number of stable and efficient production practice bases that can meet the training of engineering practice ability of related majors has become a difficult problem for universities. Due to the limited resources, it is neither necessary nor difficult to build, operate and manage numerous production practice bases by universities alone. This study investigates the present situation and satisfaction of engineering students' production practice, analyzes the causes of existing problems in production practice, seeks solutions, promotes the improvement of production practice teaching quality, and explores ways of close cooperation in Industry-University-Research to better meet the needs of teaching, students and enterprises.

1. Introduction

Production practice is a practical link for college students after completing all basic courses and professional courses [1]. Through the production practice in the production link of the enterprise, the theory and professional knowledge learned in the classroom are further consolidated and deepened, which lays a solid foundation for the subsequent graduation design, graduation thesis and employment. The rapid development of science and technology, the increasingly fierce social competition and the increasing employment pressure have put forward higher requirements for the comprehensive quality of every engineering student [2-3]. Therefore, it is of practical significance to study the present situation of students' production practice on the basis of previous studies and put forward countermeasures in areas that need improvement.

In recent three years, due to the influence of social and economic environment and epidemic changes, many engineering colleges have some common problems in production practice, such as: the combination of production practice and specialty is not close, the number of production practice units is insufficient, and the safety guidance of production practice is not comprehensive [4]. This study investigates the present situation and satisfaction of engineering students' production practice, analyzes the causes of existing problems in production practice, seeks solutions, promotes the improvement of production practice teaching quality, and explores ways of close cooperation in Industry-University-Research to better meet the needs of teaching, students and enterprises.

2. Research objects and methods

2.1. Research objects

This study takes 158 engineering students from 41 universities all over the country as the research object. All of them are college students who have had production internships and have not graduated. The inclusion criteria of the research object include: engineering college students who have participated in production practice; College students; Informed consent and voluntary participation in this questionnaire survey.

2.2. Research method

On the basis of consulting the production practice outlines of universities and the relevant guiding documents and materials of the research on the present situation of production practice of engineering students, the questionnaire is formulated. After discussion with experts, consultation and revision, the questionnaire was determined.

According to the research needs, collect the production practice outlines published in the websites of major universities. This paper makes a statistical classification of production practice methods, production practice requirements, production practice score evaluation, production practice credits and production practice time arrangement in universities across the country. Based on more than 100 research results on the production practice of engineering students published in the Internet database, a questionnaire is designed to ensure the authenticity and effectiveness of the questionnaire. A total of 158 questionnaires were distributed, and 158 valid questionnaires were recovered, with an effective recovery rate of 100%.

Use SPSS26.0 to analyze the statistical data of the questionnaire survey, and use percentage statistics, contingency table analysis and other methods to process and analyze in the process.

3. Investigation results of production practice of engineering college students

3.1. Basic situation of production practice for engineering students

This study mainly focuses on investigating the current situation of production practice of engineering college students, and obtains the main samples from the basic information of the questionnaire, including safety engineering, environmental engineering, military command, materials science, computer science and technology. The results show that the centralized production practice mode arranged by the school and the decentralized production practice mode in which students independently contact production practice units are the main production practice modes for engineering students. The production practice period is mainly concentrated in the last semester of junior year and the last semester of senior year. The weeks of production practice are mainly two, four and six weeks. The credits are two to six credits.

3.2. Satisfaction degree of production practice effect

The survey on the satisfaction degree of 158 engineering students' production practice shows that they are very satisfied, satisfied and average, accounting for 34.3%, 33.3% and 29.6% respectively, while only 2.8% are dissatisfied. It can be seen that students are generally satisfied with the effect of production practice (see Figure 1 for details).

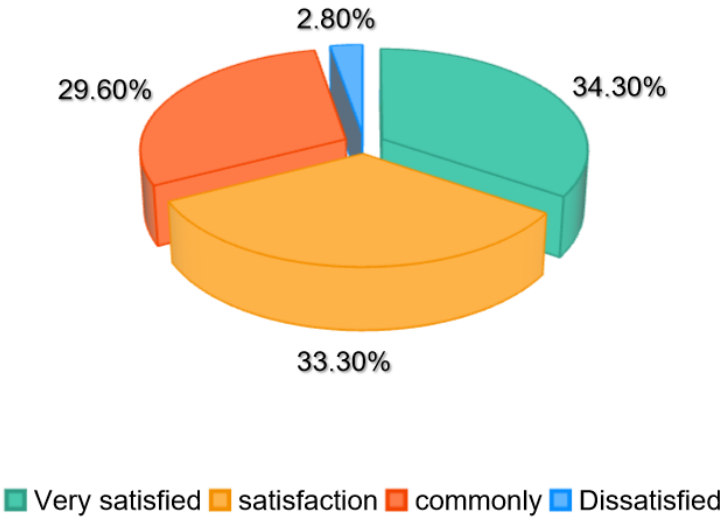

Figure 1: Satisfaction degree of production practice effect

3.3. Satisfaction degree of production practice resources

The survey results show that 30.6% of engineering students are very satisfied with the production practice resources, 40.7% are satisfied, 25.0% are ordinary, and 1.9% are dissatisfied and very dissatisfied. The vast majority of students are satisfied with the resources of production practice.

Among the resources provided by engineering students' production practice units, 56.5% and 55.6% are satisfied with the production practice environment (production practice workshop environment and enterprise scale) and the technical guidance of the person in charge of the enterprise respectively, 39.8% and 35.2% are satisfied with the enterprise management mode and production practice facilities and equipment respectively, and 5.56% choose other ones.

3.4. Satisfaction degree of rationality of production practice arrangement

The survey of engineering students' satisfaction with the arrangement of production practice (time, mode, place and enterprise management) shows that 39.8% are satisfied with the arrangement of production practice; 29.6% students are very satisfied with the arrangement of production practice; 26.0% chose general; 1.9% and 2.9% were dissatisfied and very dissatisfied. Generally speaking, engineering students think that the arrangement of production practice is reasonable, but nearly one third of them think that there is room for improvement.

3.5. Problems existing in production practice arrangement

Engineering students think that the problems existing in the arrangement of production practice show that 41.7% people think that the schedule is approaching graduation; 39.8% people think that the production practice time is too short; 34.3% people think that the content of production practice is too single; 29.6% people think that they lack knowledge of production practice; 26.9% people think that the production practice time is too long; 21.3% people think that the instructor is not clear about the arrangement of production practice process. This shows that many people think that graduation will affect the effect of students' production practice. It is also worth considering to enrich the content of production practice and improve the understanding of production practice.

3.6. Evaluation method of production practice

By investigating the evaluation methods of production practice in universities, it shows that 73.0% choose production practice performance and production practice report as the evaluation methods; 44.4% evaluated the production practice through the production practice diary; 40.7% according to the analysis of teachers' inspection; There are also 38.9% school evaluation methods that are production practice defense; 16.7% people choose to record videos for evaluation. See figure 2.

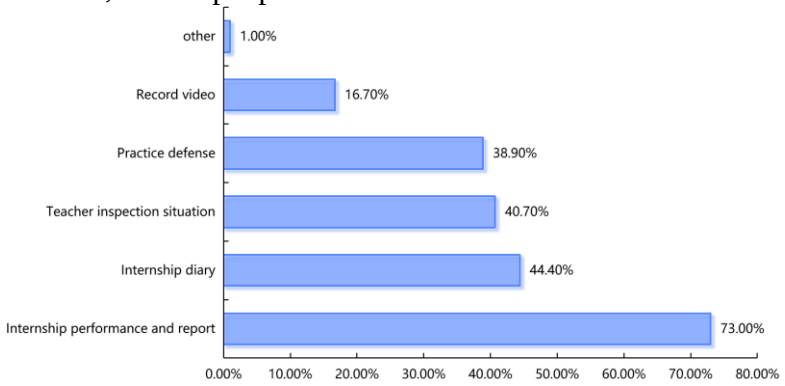

Figure 2: Evaluation method of production practice

It can be seen that the most traditional evaluation methods are production practice performance and production practice report. Production practice diary, production practice defense and other evaluation methods are also constantly applied, and may be affected by the epidemic situation. Video recording has also become a new evaluation method.

3.7. Problems in the evaluation method of production practice

The problems found in the evaluation method of production practice show that 52.78% think that the evaluation method of production practice is single; 39.81% students think that there is plagiarism in production practice notes and reports; 37.04% people think that the evaluation of production practice pays attention to the results and ignores the importance of the process; 30.56% think that the evaluation standard of production practice is vague; 28.7% think that the operation evaluation of production practice is difficult and difficult to complete. See Figure 3 for details.

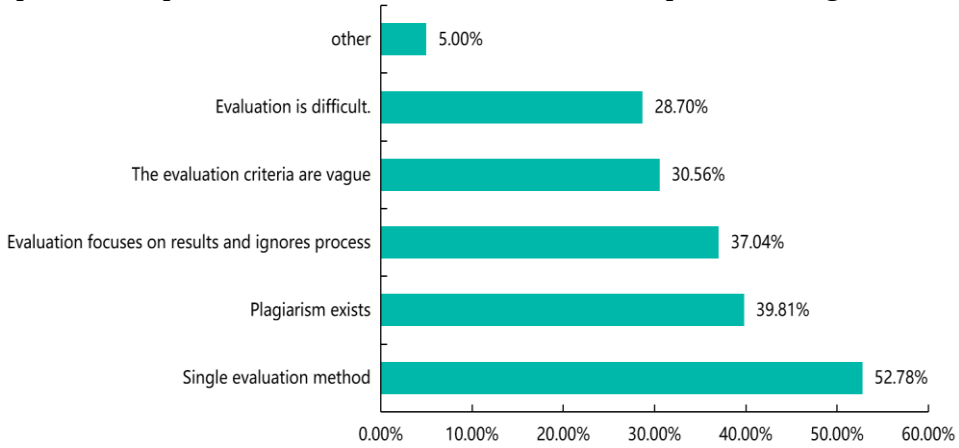

Figure 3: Problems in evaluation methods of production practice

4. Countermeasures for optimizing production practice

4.1. Strengthen the connection between schools and enterprises

After sending students to production practice units, schools should strengthen the follow-up management of students. Schools should coordinate the relationship among schools, employers and students, so that students can really learn knowledge in production practice and learn how to integrate into the corporate culture of production practice units [5]. Universities can adopt the strategy of bringing in and going abroad to strengthen the cooperation between schools and enterprises. Introduction means that universities can invite senior professional and technical personnel from enterprises to give lectures to college students and participate in the formulation of professional training programs to make the courses meet the needs of society. And when accepting the job training of enterprises, so as to be a production practice instructor, it will be convenient to communicate and communicate with students because they are familiar with each job. We can also strengthen the cooperative relationship between universities and enterprises through teachers' participation in project declaration and project research and development of enterprises.

4.2. Increase the input of production practice resources

It is found that more than half of engineering students think that the number of production practice units should be increased. Regarding the reasons for the shortage of production practice units, some studies show that, on the one hand, many majors are difficult [6-7], and the corresponding production practice equipment is in short supply; On the other hand, with the increasing popularity of electronic equipment, enterprises are worried that their core competitive production processes or technologies will be leaked for their own safety reasons, thus bringing business risks to enterprises. In addition, from the survey results, more than half of the students choose the school to provide students with production internship funds, and increase the funds to promote the motivation of students' production internship. Increasing the cooperation between the school and production practice units and providing accommodation for students can improve students' enthusiasm.

4.3. Reasonable arrangement of production practice time

Through investigation, the single content in the process of production practice is also a problem exposed, which is closely related to the short production practice time. In a short period of time, students can't choose their own professional direction of production practice according to their own specialties and interests, which will restrict students from broadening their knowledge and improving their professional skills. The production practice process only records the teacher's on-site explanation mechanically, which makes it difficult to train students' practical ability and cultivate their ability to find, analyze and solve problems, thus affecting the realization effect. Therefore, it is suggested that schools enrich the content of production practice and extend the time of production practice appropriately. The school arranges production practice in a unified way, increases the content of production practice, and deepens students' cognition of specialty.

4.4. Improve the assessment methods

Perfect assessment methods can make students pay full attention to production practice and objectively evaluate their achievements [8]. Students' production practice should comprehensively assess the production practice notes, production practice reports and production practice cases with

the characteristics of engineering production practice, focusing on the ability of combining professional theoretical knowledge with practice and practical ability of students. The evaluation of production practice results strives to objectively and truly reflect students' actual level, ability and performance. Checking notes at ordinary times can keep abreast of students' production practice and find problems in time [9]. It accounts for 30% of the whole production practice. Theoretical examination examines the students' theoretical level, which accounts for 10% of the whole production practice score. On-site assessment accounts for 40% of the whole production practice, which shows its importance. The assessment of production practice report, which accounts for 20% of the whole production practice score, is evaluated by the instructor according to the requirements of the production practice outline.

4.5. Establish a good information feedback system

In order to improve the quality of engineering students' production practice and solve the problems in their production practice, it is necessary to establish a good information feedback system. Good communication should be maintained between universities and enterprise management, leading teachers of university production practice, management personnel of enterprise production practice and production interns, so as to find possible problems in time and nip them in the bud as far as possible [10]. In the process of production practice, university leaders and enterprise leaders should keep in touch, and discuss and negotiate the difficulties or problems encountered by students in the process of production practice to ensure the orderly conduct of production practice.

5. Conclusions

In this study, the questionnaire survey was used to investigate the production practice of engineering students, and the results showed that the satisfaction degree of engineering students was generally high. There are some problems in production practice, such as short production practice time and vague evaluation criteria. The countermeasures put forward in this study mainly include strengthening the relationship between schools and enterprises, increasing the input of production practice resources, reasonably arranging the production practice time, improving the assessment method and establishing a good information feedback system. The survey object of this study is university engineering students, but it has not been investigated in enterprises. In the follow-up study, we should have a comprehensive understanding of the difficulties faced by enterprises in providing production practice, which is helpful to deeply analyze the factors affecting the effect of production practice.

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