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Exploration and Practice of Integrating Engineering Education with Communication Engineering Teaching

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Abstract: Engineering education professional accreditation is internationally recognized as an important means to improve the quality of engineering education at present.Its purpose is to strengthen and improve the quality of engineering education by establishing the quality standards and evaluation system of engineering education to enable engineering personnel training to adapt to our country's economic and social development and industrial structure adjustment on the requirements of personnel training.Taking the communication engineering major of a forestry university as an example,this paper analyzes the problems existing in the current engineering education from the aspects of teaching content,teaching methods,assessment methods and practices,and puts forward specific measures to reform teaching methods and assessment methods such as strengthening the integration of teaching content and production practice,combining multiple assessment methods and taking the project as the carrier.Through the practice of teaching reform,students'engineering ability and innovation ability have been significantly improved.

Keywords: Engineering education;Communication engineering;Integration of professional teaching;Exploration and practice

1. Introduction

Engineering education professional accreditation is an important means to improve the quality of engineering education,and is an international standard in engineering education.It is of great significance to promote the reform and development of engineering education in our country and to promote our country to conform with international engineering education.Output-oriented,student-centered and continuous improvement are the core concepts of engineering education certification.College teaching reform should take cultivating students'engineering ability and innovation ability as the core content,and pay attention to students'understanding and application ability of knowledge,and improve students'ability to solve practical problems through the reform of teaching content,teaching method and examination method.The major of communication engineering is a comprehensive major that is based on electronic information technology,involves communication and information system,circuit and system,electromagnetic field and microwave technology and other interdisciplinary.The major has strong comprehensiveness and intersectionality,which mainly trains students to master the basic theory and basic knowledge of electronic information technology and its application,and master the basic skills of electronic circuit design,electronic equipment development and communication system and equipment design.

2. Problems Existing in Current Engineering Education

At present,China's engineering education is in the key period of transforming old and new kinetic energy and accelerating the construction of higher education power,but there are still some problems in the development process:the quality assurance mechanism of engineering education is not perfect.China's engineering education has not yet formed a unified quality standard and accreditation system,talent training is out of line with market demand,students lack interest in engineering practice,and students are difficult to find employment and entrepreneurship.At the same time,the engineering education teaching quality evaluation system is not perfect,the supervision of engineering education personnel training is insufficient,and the engineering education teaching quality standards and accreditation system need to be improved.The teaching content is out of line with the actual production.In undergraduate teaching,the connection between the content of engineering education courses and actual production processes and equipment operation is insufficient,resulting in a lack of practical production experience support for students'understanding of theoretical knowledge and a significant gap between them and the actual job requirements.There is a weak practice.Under the current background of new

engineering construction in colleges and universities,all colleges and universities emphasize students'innovative consciousness and practical ability,but the lack of effective guidance and management mechanism in the practice of communication engineering makes it difficult for students to apply what they have learned to practice,resulting in students'weak grasp of theoretical knowledge and insufficient engineering ability and innovation ability.The teaching method is single.In course teaching,the traditional teaching mode of irrigation and full classroom irrigation is still used,which neglects the role of students as the main body and the leading role of teachers.At the same time,there is an excessive emphasis on written test results in the examination and assessment methods,without combining theoretical knowledge with practical applications.

3. The Teaching Content is Integrated with the Production Practice

In engineering education professional accreditation,teachers'mastery of professional knowledge directly affects students'learning of professional knowledge,and students'mastery of engineering application ability also directly affects the teaching effect.Therefore,in the process of engineering education,teachers should take engineering practice and engineering project as the starting point and destination of teaching content.In the course of communication engineering undergraduate teaching,students should be able to use the theoretical knowledge to solve practical problems through various experiments,internships and practices,and apply it to solve more practical problems.At present,there are several problems in the teaching process of communication engineering major:the course content is out of line with the actual industry.In the course teaching,the course content design is no combination of communication industry development trend and new technique and technology,new materials,new equipment and other aspects.The content of experimental teaching is out of line with the actual production.Due to the lack of practical and experience,students'practical ability is poor.The practice is out of step with the reality of the industry.The employment direction of communication engineering graduates is mainly the design,commissioning,operation and maintenance of communication systems,which are basically undertaken by enterprises,and the demand for communication talents is basically concentrated in the production line,which leads to the lack of work experience and ability of many students after graduation.

4. Adopt A Variety of Assessment Methods

At present,the assessment methods of students majoring in communication engineering are mostly closed paper exams or ordinary scores,which do not play a good role in monitoring the learning effect of students.Through the reform,the assessment model of"final examination+process assessment"has been established.The process assessment score accounts for 50%,the final examination score accounts for 50%,and the sum of the process assessment score and the final examination score reaches more than 60%can be regarded as"qualified".Among them,the process assessment mainly includes attendance,class performance,homework completion and so on.Classroom performance includes classroom questioning and classroom participation;Assignments include homework,course papers,lab reports and project design reports;Course papers mainly examine the degree of students'mastery of the relevant knowledge of the course and the ability to comprehensively apply the knowledge to solve practical problems;The project design report mainly examines the students'ability to apply the knowledge comprehensively.The assessment method is flexible and diverse,which can better monitor the learning situation of students,and also make students grasp the course content more comprehensive and systematic.

5. Take the Project as the Carrier

In order to strengthen the cultivation of students'engineering practice ability and innovation ability,in the talent training program for communication engineering majors,"Electronic design Competition","Datang Cup","Blue Bridge Cup"and other competitions as well as innovative training projects for college students are carried out with the project as the carrier and the teachers as the guidance,which are regarded as important contents of students'graduation design.

Electronic design competition is a very effective way to train students'practical ability.In the process of participating in the electronic design competition,students develop problem awareness,engineering awareness and the ability to solve practical problems through contact with practical engineering projects.Teachers can select excellent works from many entries to explain and guide students to complete the final works.Through project-based learning,students'ability to analyze and solve problems and teamwork spirit can be improved,and students'innovative consciousness and hands-on ability can be enhanced.By participating in the electronic design competition,students can not only learn relevant knowledge,but also develop innovative ability.

6. Strengthen Practice

Strengthening the practice is an important means to improve students'practical ability and enhance students'engineering ability,and is one of the important contents of engineering education accreditation.Communication engineering majors focus on cultivating students'engineering practice ability,and strengthen experimental practice.Through cooperation with enterprises,students can get in

touch with actual communication equipment in experimental classes,have a deep understanding of the principle and performance of communication equipment,and better understand the theoretical knowledge involved in the course.At the same time,by combining the course design of communication principle,signal and system,data communication and graduation design,the course design is combined with the actual production equipment.Using multimedia teaching means,teachers can deepen students'understanding of curriculum knowledge through the explanation,experiment demonstration,etc.The experiments are used to cultivate students'ability to use instruments and equipment,hands-on skills,comprehensive application of theoretical knowledge,and ability to analyze and solve problems.

7. Conclusion

Under the background of the rapid development of science and technology and the continuous adjustment of industrial structure,the teaching reform of engineering education and communication engineering has become an urgent task.First of all,we need to make it clear that the purpose of integrating engineering education with communication engineering teaching is to improve the quality of talent training,so that students can better adapt to the needs of social and industrial development. However,the existing problems in engineering education,such as the disconnection between theory and practice,the disconnection between teaching content and production practice,and the single assessment method,have seriously affected the realization of the goal.Therefore,we need to carry out reform and innovation in the integration of teaching content and production practice,the combination of various assessment methods,taking the carrier as the projects and strengthening the practice.Only in this way can we truly realize the integration of engineering education and communication engineering teaching and improve the quality of talent training.In the future study,we will continue to pay attention to the development trend of the integration of engineering education and communication engineering teaching to provide more theoretical support and practical guidance for improving the level of engineering education in China.

References:

[1]Zhenyu Liu,Ling Yuan&Wenhui Zhang.Informatization Reform and Practice of Communication Engineering Major Oriented to Engineering Education Professional Accreditation[J].China Modern Educational Equipment,2022(13):76-79.

[2]Yan Zhang,Wancheng Zhang&Zesong Fei.Innovation in the Internship and Practice Mode of Communication Engineering Through Industry-Education-Research[J].University Education,2022(09):245-247.

[3]Pengwei Wen,Lei Yang,Xuzhao Chai et al.Exploration on Teaching Reform of Mobile Communication Course of Communication Engineering Major[J/OL].China Educational Technology&Equipment:1-3[2023-09-28].