

Exploration of Huawei Advanced Network Technology Curriculum Reform under the Background of School enterprise Cooperation

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Abstract: At present, the training of network communication talents in colleges and universities should also keep pace with the times to achieve the connection between the talent supply side and the industry demand side. Based on the background of Huawei's school enterprise cooperation, guided by the output of students' learning achievements and ability development, this paper studies the significance and cooperation methods of school enterprise cooperation in this course, which can better serve the curriculum system of communication engineering and lay a better foundation for training application-oriented talents.

Keywords: School enterprise cooperation; Advanced network technology; Communications technology.

1. Introduction

The communication engineering major mainly trains the product implementation, operation and maintenance departments for intelligent communication equipment, network communication enterprises and other various enterprises and institutions, and trains high-level technical and skilled talents engaged in the testing and development of mobile communication products and intelligent communication equipment, pre-sales and after-sales engineers, and network operation and maintenance.

Utilize the social resources of government, school and enterprise, implement the new "five in one" school enterprise cooperation mode of teaching steering committee, internal and external practice bases, order classes, industrial colleges, and school enterprise alliance, build a new "six in one" collaborative education mechanism of "co management, co system, co construction, co-education, sharing, and co research", and achieve a talent training community with multiple participants who complement each other's strengths, build projects, and share results, Practice deep cooperation and collaborative education in the true sense. Through the integration of industry and education and collaborative education, the latest technologies developed by enterprises are timely integrated into school teaching, promoting the promotion of new technologies independently developed by enterprises, jointly promoting industrial transformation and upgrading, and making advanced technologies enhance students' employment competitiveness.

Huawei's advanced network technology is an important technical means of network construction and management in Huawei's ICT ecosystem. The main content of this course is the common technology in practical work. By learning Huawei Advanced Network Technology, students can master the basic principles and operation methods of network technology, so that they can independently complete the construction, maintenance and fault handling of small networks in the face of real business scenarios.

2. Current teaching problems

2.1. The construction of professional curriculum knowledge is slow, lagging behind the social demand and the update of network technology

At present, the network technology curriculum system of most colleges and universities is not perfect and flexible enough, the curriculum setting is mechanical and the incentive measures are insufficient, so it is difficult to give full play to the subjective initiative of teachers and students to actively improve the curriculum teaching. First of all, traditional classroom teaching mode is often used in teaching, that is, the mode of teachers "pouring in" and students learning passively. The teaching design is dull and insipid, resulting in a dull classroom teaching atmosphere; Secondly, the teacher one-sided emphasizes the learning process of knowledge, neglects the cultivation of students' practical application ability and thinking ability, students' personality cannot be fully developed, and they lack innovative consciousness and ability; Third, the teaching methods and means are backward, and the construction of software and hardware for specialized courses is unbalanced. Modern network technology course teaching must rely on multimedia based audio-visual teaching facilities, including multimedia classroom, electronic laboratory, network remote classroom and so on. However, due to the influence of traditional teaching thinking, most teachers have not completely changed their teaching concepts. They still use a relatively single teaching method to explain some complicated and difficult theoretical concepts, which leads to the low quality of classroom teaching.

2.2. Inadequate cultivation of one-sided practical ability in theoretical knowledge learning

Compared with the basic courses of computer network technology, there are fewer advanced network technology courses in colleges and universities that include new practical

contents such as network reliability, security, network management, etc. Most of the courses in colleges and universities that have been set up are also mainly about theoretical knowledge. Although it is helpful for students to understand and master the principles related to network technology, it is limited to the cultivation and improvement of students' practical ability. There are even fewer courses based on Huawei network equipment. As show in Fig. 1:



Fig. 1 Interface diagram of eNSP simulation platform

2.3. The gap between the curriculum practice and the actual requirements of the enterprise is too large

In the current network technology courses offered by domestic colleges and universities, most of the teaching in the practical part focuses on simulation, and the simulation platforms and equipment types are different. But few of them can be applied to real equipment and take real cases of enterprises as projects. This leads to a large gap between the practical teaching of most of these courses and the actual application of enterprises.

3. Analysis of the current situation of our advanced network technology courses

Our school focuses on cultivating application-oriented talents and students' practical application ability. At present, the network technology courses offered by the communication engineering major are based on Huawei Data Communication Laboratory, which is a cooperation between schools and enterprises, and taught in combination with theoretical knowledge. This course is a professional compulsory course for communication engineering majors. It already has a lot of curriculum resources based on school enterprise cooperation, mainly including courseware, test question library, homework library, teaching plan, etc. The teaching materials of the course are sufficient.

This course is one of the newly opened courses in recent two years, although the teaching resources have been basically constructed and improved. However, the depth of school enterprise cooperation is not enough. How to enable students to further have the problem-solving ability, overall planning ability and team writing ability required by enterprise talents on the basis of understanding theoretical knowledge and mastering practical ability is the focus of this educational reform.

4. Specific reform contents

4.1. Enrich the construction of curriculum resources by utilizing the resources of school enterprise cooperation and taking the secondary college of Huawei as the traction

The first is the selection of teaching materials. Huawei ICT series of certified books are selected for this course, and Advanced Network Technology is also the textbook designated by Huawei Institute of Information and Network Technology. The course content and case arrangement of this textbook take Huawei equipment as an example. The case is practical and covers many aspects such as network reliability, security, new mainstream technology, network operation, maintenance and management. The course content mainly includes seven aspects, network reliability, access control list, network address translation, WAN, IPv6, WLAN technology, and network management.

4.2. Further deepen practical teaching based on teaching content and enterprise demand

The practical teaching of this course adopts the supporting experimental instruction manual of Advanced Network Technology in the series of textbooks on route switching technology of Huawei ICT Academy. It is applicable to students who are using Advanced Network Technology for learning. It is helpful for students to apply theoretical knowledge to practice and further deepen their understanding of theoretical knowledge.

4.3. Further deepen teaching in combination with school enterprise cooperation laboratory

At present, the network technology courses offered by the communication engineering specialty are based on the Huawei Data Communication Laboratory, which is a school enterprise cooperation, and are taught in combination with the Huawei eNSP virtual platform. ENSP provides a convenient graphical operation interface, which makes complex networking operations easier. It can intuitively feel the device form. It also supports one click access to help and querying device information on Huawei's website. The simulation is carried out according to the support characteristics of the real equipment. The simulated equipment has many forms, comprehensive support functions and high simulation degree. It can connect with real devices, support the binding with real network cards, and realize the connection between analog devices and real devices. The networking is more flexible, which is very suitable for this course.

The laboratory used in the course is Huawei Datacom Laboratory jointly established with Huawei Technologies Co., Ltd. Huawei Datacom Laboratory is a strategic cooperation between our school and Huawei Technologies Co., Ltd. to give full play to their respective advantages and jointly build a professional laboratory set up by Huawei Institute of Information and Network Technology (Huawei ICT Institute). The laboratory is equipped with an IP integration experimental system, including AR2200 series export routes, USG6530 series firewalls Enterprise gateway, S3700/5700 series switches, RH2288 server and other experimental

equipment. The above devices can be used to implement the HCIA and HCIP of Huawei Data Comm (R&S routing and switching). The highest authentication level is HCIE. The topology can be changed at any time to configure according to the course requirements.

4.4. Enterprise experts enter the classroom and further strengthen the cooperation between schools and enterprises

In order to ensure the in-depth teaching mode of school enterprise cooperation, the school also hired Bian Ning, an enterprise part-time teacher with intermediate professional and technical titles and rich production practice experience from Liaoning Branch of Ninghan iResearch Information Technology Co., Ltd., to share enterprise experience, further cultivate students' interest in learning and guide students' future career planning.

The teacher is the input of the curriculum system, and the student is the output of the curriculum learning process. Through the reform of this curriculum, the ideal output can be obtained. The school enterprise cooperation teaching mode is a new teaching method in the new era, and everything is based on the excellent construction of online teaching resources, that is, the combination of traditional teaching and enterprise personnel training. The integration of this mode and communication teaching can stimulate students' enthusiasm for learning, improve students' initiative, and maximize the teaching effect.

5. Project features and innovative features

Compared with the traditional network technology course construction, the school enterprise cooperation resources of Huawei ICT College are used for teaching resource construction and teaching reform to cultivate the ability to design, develop, debug and apply modern enterprise networks, have certain innovation and entrepreneurship ability, have strong employability and sustainable development ability, and be competent for network operation and maintenance with a sense of social responsibility, innovation spirit High level

technical talents with international vision and strong practical ability.

This course is built on the basis of Huawei ICT Academy. The course content is highly practical, and many new technologies and equipment are applied, which is relatively rare in the courses of other colleges. Therefore, the relevant construction of this course is also a supplement to this part of the blank.

The college actively encourages curriculum reform, changes the existing traditional teaching mode, enables students to better adapt to the school's "application oriented, learning to apply" positioning, students to formulate future career development plans, and actively carry out school enterprise cooperation, which are the driving force and effective guarantee of curriculum teaching reform.

6. Conclusions

In the construction of the practical teaching resource library, the original experimental methods are changed, and the experimental courses are less emphasized. Instead, the integration of theory and practice is adopted to increase the opportunities for students to participate in and design, so that students can use online resources to make early preparations when they are out of class, carry out real case practice of design enterprises when they are in practice, and analyze and summarize after class, so as to deepen the understanding of knowledge.

References

- [1] Deng Lin. Research on the Application of Computer Network Technology in the Training of Talents in Vocational Education. *Journal of Physics: Conference Series*, Vol. 1865(2021)90-95.
- [2] Zhou Xiaoyan. Research on the course reform of "Routing and Switching Technology" based on Huawei certification. *Network Security Technology and Application*, Vol. 188(2020)109-111.
- [3] Tian Guo, Liu Danning, Yu Jianwei. *Network Foundation* 2020,144-163.
- [4] Information on: www.support.huawei.com.
- [5] <http://forum.huawei.com>.