

Research on Teaching reform Path of Environmental Monitoring Technology Major in Higher vocational Colleges under the background of “Internet +”

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Abstract: The integration of Internet and environmental monitoring technology teaching is the reform and innovation of personnel training mode under the background of the new era, the demand and requirement for the training of environmental monitoring technology professionals, the new direction of the reform and development of environmental monitoring technology under the background of higher education informatization, and the fundamental reform of traditional education and teaching concepts, resources and evaluation. On the basis of a brief analysis of the background and significance of the integration of environmental monitoring technology major teaching and Internet, this paper puts forward the implementation path of the teaching reform of environmental monitoring technology major in higher vocational colleges under the background of “Internet +” from four dimensions of curriculum system, teaching content, teaching mode and teaching evaluation, in order to meet the needs of professional personnel training and help the overall improvement of professional teaching quality.

Key words: Internet +; Higher vocational college; Environmental monitoring technology major; Teaching reform; Paths

Introduction

“Internet Plus” means “using Internet technology to deeply integrate the Internet with traditional industries”. Since 2018, China has elevated the development of “Internet plus” to a national strategy, and vigorously promoted the “Internet Plus” action plan in all walks of life. In this context, as an important base for personnel training in environmental monitoring services and engineering technology, the environmental monitoring technology major in higher vocational colleges needs to actively keep up with the pace of development of The Times in teaching reform, and give full play to the advantages of information-based teaching to adapt to the new requirements of vocational education reform and development. From this point of view, the integration of the Internet and the teaching of environmental monitoring technology major in higher vocational colleges has positive practical significance.

1. The background and significance of the integration of the Internet and the teaching of environmental monitoring technology in higher vocational colleges

(1) The background of integration

At present, China’s higher education is in a changing era. The higher education is changing from traditional education to modern education, from elite education to popular education, from closed education to open education. In this context, the information technology represented by “Internet +” is affecting all aspects of society. Informationization, networking and digitization will become the new trend of education development in the future. On the one hand, the Internet is the main channel for college vocational students to obtain information, broaden their horizons, and understand the new trends of the country or the industry. No matter when and where, students can use fragmented time to browse the content they are interested in, and conduct more free study and research; On the other hand, almost every vocational college student is equipped with one or more smart devices, mobile phones, tablet computers, notebooks and so on have become commonplace for them. Over-indulgence in mobile phones or other electronic devices will directly affect students’ learning efficiency and do no good to their healthy growth. At this time, teachers should focus on a series of questions such as “how can we give full play to the positive guiding role of smart devices and help improve the teaching quality of professional courses with the power of the Internet?”. Until the promulgation of the Outline of the National Medium and Long Term Education Reform and Development Plan (2010-2020), the revolutionary impact of the Internet on the development of education has been clarified. From the perspective of macro development, the reform of higher education must follow the road of information technology, and the modernization of education has become an inevitable trend of The Times.

(2) The significance of integration

The integration of the Internet and the teaching of environmental monitoring technology is conducive to the establishment of a classroom teaching model combining online and offline, and improving students’ learning initiative and enthusiasm; It is helpful for teachers to change the traditional teaching idea and better carry out the teaching work of environmental monitoring technology major; It will help to cultivate students’ ability to discover, analyze and solve problems, and improve students’ ability of independent learning and lifelong learning. At the same time, the professional knowledge of environmental monitoring technology involves many fields, including many disciplines including environmental planning, environmental management, environmental chemistry, etc. If the Internet technology can be flexibly applied in the professional teaching process, then teachers and students can quickly understand many obscure professional terms and concepts through the network. Students will also come into contact with more real environmental cases. Through teachers’ patient explanation in class and students’ serious and in-depth analysis and discussion, we believe that we can get twice the result with half the

effort.

2. The feasibility path of teaching reform of environmental monitoring technology major in higher vocational colleges under the background of “Internet +”

(1) Clarify the training objectives and reconstruct the curriculum system

The training goal of environmental monitoring technology professionals in higher vocational colleges is to cultivate high-quality technical and technical talents who master the basic knowledge and technology of environmental monitoring, have certain humanistic literacy, scientific literacy, professional literacy, innovation and entrepreneurship ability and sustainable development ability. At the same time, the professional of environmental monitoring technology in higher vocational colleges should serve the development of environmental protection industry, so it is necessary to integrate the relevant contents of environmental protection industry in the personnel training, such as the ability of sustainable development and the ability of ecological civilization construction. In addition, in the construction of the curriculum system, it is necessary to determine the curriculum system according to the working process and task of environmental monitoring post group on the basis of clarifying the training objectives of environmental monitoring technology professionals in higher vocational colleges.

The environmental monitoring technology major of higher vocational colleges should be guided by the demand of employment positions, based on professional ability and based on professional standards to build a new talent training program. From a macro point of view, the curriculum system of environmental monitoring technology should cover “four modules” : introduction to environmental monitoring, principle and technology of instrument analysis, water and wastewater monitoring, and air pollution monitoring and treatment. Each module should determine the specific content of the course system based on the needs of professional posts. For example, the module of “Introduction to Environmental Monitoring” should include “Principles and methods of environmental monitoring”, “Air pollution Detection and control” and other related content; The “Principle and technology of instrument analysis” module should include “Basis of Instrument Analysis”, “Environmental instrument analysis” and other related content; The module of “Water and wastewater monitoring” should include “Water sample Collection and preservation” and other related content; The module of “Air Pollution Detection” should include “Principles and Methods of Automatic Monitoring of Air pollutants” and other related content. In each module, the teaching of theoretical courses and practical courses should be closely connected, and a good foundation for the follow-up work should be laid by creating a special environmental monitoring data platform.

(2) Give full play to the advantages of the Internet and expand the teaching content

The curriculum of environmental monitoring technology is relatively complete in environmental science majors, covering environmental monitoring, environmental management, environmental quality assessment and other professional courses, which is a strong practical discipline. However, at present, the teaching content of environmental monitoring technology major in some higher vocational colleges is not rich enough, and there is a certain lag, which is difficult to meet the needs of students for high-quality employment. In order to solve this problem, higher vocational colleges should make full use of the advantages of the Internet and broaden the teaching content.

Take “Water Environment Monitoring” as an example, which is a core course of environmental monitoring technology major in higher vocational colleges, but also a very practical course. Due to the lack of professional theoretical knowledge foundation and practical experience, students are not enthusiastic about this course. Therefore, teachers can properly integrate real cases and project tasks of enterprises in the teaching process. Firstly, teachers should decompose and refine the pollution factors and monitoring methods in water environment monitoring technology, and introduce actual cases or project tasks into the teaching process; Secondly, teachers should combine the teaching content with relevant industry standards to clarify the specific requirements of industry standards for environmental monitoring; Finally, in the teaching process, teachers should guide students to think actively, learn independently and explore independently with the help of micro-lessons and MOOCs.

In addition to “Water Environment Monitoring”, real cases or project tasks of enterprises can also be introduced into the teaching process of other courses. For example, in the course of Chemical Analysis, project tasks such as “collection and preservation of water samples” and “laboratory analysis” can be introduced; In the course of “Water Quality Sampling and Transportation”, project tasks such as “Water quality sampling and transportation”, “water quality sample preparation and preservation” and “water quality sample analysis” are introduced; “Air sampling and transportation”, “Air quality evaluation” and other project tasks are introduced into the course of “Atmospheric Monitoring”. By introducing real enterprise cases or project tasks into the teaching process, it can not only enhance students’ learning interest and expand their knowledge system, but also play a positive role in improving their practical ability and innovation ability. Most of these projects and cases originate from the Internet, which can highlight the advantages of the Internet.

3. Optimize the teaching mode by relying on the network media

On the one hand, it is necessary to strengthen students’ learning autonomy and increase their participation in class, so that students can take a more active part in the learning process. Teachers can concretize and visualize the abstract content through video resources such as micro-lessons and MOOCs to enhance students’ interest in learning. At the same time, they can also carry out online teaching activities by means of flipped classroom and project teaching. Before class, teachers can upload teaching resources to the online platform for students to learn. In class, teachers can present teaching content to students through PPT display, video playback and other ways, and guide students to prepare for the preview before class; After class, teachers can assign relevant homework according to the classroom learning content for students to consolidate and digest the knowledge. In the process of practical teaching,

teachers should combine “Internet +” technology to build a “smart classroom” platform and a virtual simulation training platform, and give full play to the advantages of “Internet +” technology. For example, through the introduction of simulation software, students are guided to go deep inside the instrument through 3D and 4D image simulation operation, and embedded in micro-lessons, so that students can learn and master the internal structure principle of the instrument efficiently. On this basis, students’ learning interest can be fully stimulated. On the other hand, the cooperation between schools and enterprises should be strengthened. Higher vocational colleges should establish a close contact mechanism with industry enterprises through the network, and deepen the integration of industry and education by jointly carrying out professional practice projects and professional competitions.

(4) Restructure the assessment methods to improve the quality of talents

Assessment is an important means to test the teaching effect, and it is also a key link to assess whether students have vocational ability. At present, the examination content of environmental monitoring technology major in higher vocational colleges is mainly written examination, and students’ practical operation ability can not be effectively examined. In order to solve this problem, higher vocational colleges need to change the traditional examination into a comprehensive evaluation method combining process evaluation and final evaluation, which is of great significance for stimulating and cultivating students’ learning enthusiasm. Under the background of “Internet +”, in order to further improve students’ learning enthusiasm and participation, teachers can innovate assessment methods with “Internet +” thinking. On the one hand, teachers can use mobile APP to provide students with online tests and learning assessment functions, and grasp students’ learning status in time through tests; On the other hand, teachers can use mobile APP to communicate and interact with students online and answer their questions in the learning process in a timely manner. This will not only help teachers to learn about students’ learning in class, but also help teachers to adjust teaching strategies and teaching methods in time.

Epilogue

To sum up, the teaching reform of environmental monitoring technology major in higher vocational colleges under the background of “Internet +” should start from the characteristics of the specialty and carry out teaching activities with students as the main body. Through the application of network media and the optimization of teaching mode, not only can the abstract content be concretized, visualized and concretized, but also can make students better understand the course content and knowledge, and at the same time can cultivate students’ independent learning, independent exploration and self-management ability. From this point of view, it is imperative to carry out the teaching reform of environmental monitoring technology major in higher vocational colleges based on the Internet.

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Project:

1. Wuhu City Science and Technology Plan Project - Key research and development projects, portable electrochemical sensor industrial preparation and application in the environment (2021yf50);
2. University-level Quality Engineer-Production-Education Integration Training Base Project of Wuhu Vocational and Technical College, Production-Education Integration Training Base of Wuhu Zhongyi Testing Technology Research Institute Co., LTD. (04170009)