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Choice of Informatization Teaching Path for Professional Basic Courses in Science and Engineering Universities

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Abstract: With the development of the times, the informatization teaching in universities of science and engineering has made significant progress. However, the specialized basic courses in these universities started relatively late and have not yet established a complete curriculum system. Therefore, how to combine the courses of these universities with traditional courses to enhance students' comprehensive abilities, cultivate talents with multicultural abilities, and gain advantages for them in the modern competitive society is a topic worthy of in-depth study. This article has explored why science and engineering colleges should offer specialized basic courses, and discussed the advantages of information-based teaching in these courses. In addition, the existing problems have been raised and corresponding solutions have been proposed.

1. Introduction

With the progress of technology, many new educational models have become popular. For example, online training, online video courses, and online audio courses are widely used by people. These new educational models have been widely used in various fields of education and have made significant contributions to improving the quality of education. With the progress of the times, the number of successful cases of information-based teaching is increasing. However, in the past few years, information-based teaching of specialized basic courses has been relatively lacking. Therefore, we need to strengthen research in this field in order to better promote its development [1-2].

2. Connotation of Information-based Teaching

With the continuous progress of science and technology, information-based education has become an important educational model, which aims to fully utilize computers and other modern technologies to effectively improve the efficiency and quality of school teaching. However, at present, information technology education is still in its infancy. Therefore, as teachers in institutions of higher learning, they should actively track this development trend and continuously explore how to apply it to practice. Although the application of information technology in teaching has achieved certain results, we should continue to make efforts to integrate it with traditional educational

methods. In addition, we should also strive to cultivate teachers' information management skills, so that they can better use these new methods to achieve teaching objectives. In order to improve teaching quality more effectively, teachers need to actively utilize information technology, constantly explore and try new teaching methods, design interesting interactive links, and promote communication and collaboration between students. Through these measures, students' practical abilities can be better cultivated. With the development of information technology, teachers are no longer limited to the traditional methods of "classroom teaching and consolidation after class", but adopt a diversified teaching model of "pre class preparation, classroom discussion, and consolidation after class", thereby stimulating students' interest in learning and cultivating their classroom learning abilities. Through the use of various information technologies, such as images, sound, animation, etc., our courses will enable students to better understand the knowledge points. These techniques can help them preview better and understand what they have learned faster. Teachers can provide students with questions about the course, and students can explore independently in the classroom. Teachers will address these issues according to the needs of students, thereby better guiding their learning. Using information technology for teaching can better reflect the personal situation of students and the teaching effect of teachers, promote students' enthusiasm and understanding of knowledge, and avoid the limitations of traditional one-way teaching and mutual learning [3-4].

3. Necessity of Developing Informatization Teaching of Professional Basic Courses in Universities of Science and Engineering

According to the Notice on Key Points of Education Informatization Work in 2017 issued by the General Office of the Ministry of Education, it is clearly pointed out that we should comprehensively study and implement the spirit of the 18th Party Congress and the 18th Plenary Session and the series of important speeches of General Secretary Xi Jinping, implement the overall deployment of the "13th Five Year Plan" for educational informatization, give full play to the supporting and leading role of educational informatization in educational modernization, and promote the universal application of information technology in teaching. It can be seen that in the context of the rapid development of information technology, it is necessary and urgent to transform the traditional teaching methods of professional basic courses and use information technology to carry out information-based teaching in universities of science and engineering.

4. Significance of Carrying out Information-based Teaching of Professional Basic Courses in Universities of Science and Engineering

In universities of science and engineering, information-based teaching of specialized basic courses has unique advantages. Compared to traditional universities, these universities have stronger computer network technology and multimedia technology, which enables them to provide richer teaching resources and help students broaden their horizons, increase knowledge, and cultivate aesthetic abilities. In addition, these universities are also able to conduct daily maintenance of network resources to ensure that students can obtain the latest art materials in a timely manner. By providing effective education and training, students' learning outcomes can be ensured. With the development of information technology, we can more effectively help students achieve fragmentation and autonomy, thereby improving learning efficiency. Although science and engineering students spend most of their time studying professional knowledge, we cannot ignore the importance of art education. Therefore, we should strive to ensure the perfect integration of professional courses and art education within a limited time. Through information-based teaching, specialized basic courses can better meet the needs of students, allowing them to make full use of

fragmented time to learn and appreciate art. This not only helps cultivate students' autonomous learning ability, independent thinking ability, and judgment ability, but also stimulates their creative thinking. It also ensures a balance between professional courses and professional basic courses [5-6].

5. Problems Existing in Informatization Teaching of Basic Courses in Science and Engineering Universities

In 2011, the Catalogue of Disciplines for Degree Awarding and Talent Cultivation (2011) clearly stated that art can be independent as a discipline and integrated into the academic system together with science and engineering. Moreover, with the implementation of "School Art" (2002) and "National School Art Education Development Plan (2001-2010)", many science and engineering universities have opened professional basic courses, thereby promoting the popularization of art education. Meanwhile, these universities are also constantly exploring new academic models, broadening the horizons of art studies, and improving the academic level of art studies, so as to better meet the needs of society for artistic talents. Although our academic background, teaching staff, and campus cultural atmosphere are superior to those of other comprehensive and liberal arts colleges and universities, there is still much room for improvement in order to better achieve our educational goals [7-8].

(1) Some teachers lag behind in their concept of information-based teaching.

In order to enable students to better receive artistic edification, universities of science and engineering usually choose specialized basic courses. These courses require teachers to have a high level of knowledge reserve, profound professional knowledge, and excellent teaching ability. Therefore, when selecting teachers, we can give priority to art teachers with longer teaching experience and deeper qualifications. However, because these professional teachers have been engaged in traditional art creation and teaching for a long time, they lack confidence in information-based teaching, resulting in the inability to make progress in information-based teaching of professional basic courses.

(2) Informatized teaching only stays on the surface, without deep application.

The teaching content should be based on information technology, combined with rich network resources, multimedia technologies such as audio and video, and organically combine the course content with online teaching to improve students' comprehensive quality and innovative ability, and provide more learning opportunities for students.

(3) The teaching method is relatively simple.

With the development of information technology, new information platforms have emerged, such as MicroBlog on SNS social media, WeChat, MOOC, and Microlecture, which have become the most popular information-based education tools at present. In addition, great changes have taken place in teaching models, the most prominent of which is the popularity of flipped classrooms. At present, many universities of science and engineering still focus on the teaching mode of professional basic courses, lacking communication and interaction between teachers and students, resulting in low classroom participation. This situation has caused the teacher's teaching to become dull and boring, and the students have become bored and lack enthusiasm for this. In order to better enhance the effectiveness of specialized basic courses, we must improve the traditional teaching model and adopt more advanced information technology. This can more effectively stimulate students' interest in art and help them better master the content they have learned.

6. Strategies for Informatization Teaching of Professional Basic Courses in Universities of Science and Engineering

(1) Cultivating teachers' information-based teaching ability and promoting the transformation of information-based teaching concepts[9-10]

Although science and engineering universities have advanced information technology, due to the lack of teachers' concept and ability of information-based teaching, they cannot fully exert their due advantages, and thus cannot meet the training needs of scientific and technological talents. In the "big bang" teaching activities of professional basic courses, teachers' "teaching" plays a crucial role. They should be enthusiastic about engaging in the practice of information-based teaching, rather than refusing or unwilling to try new teaching methods because there is only one elective course. In addition, teachers should clearly recognize that implementing information-based teaching in professional basic courses is not redundant but should be essential.

(2) Clarifying curriculum objectives, optimizing a single teaching model, and improving the evaluation system of information-based teaching

By adopting information technology, we can effectively improve traditional teaching methods, thereby better meeting the needs of today's society for versatile and innovative talents. This technology can not only improve the comprehensive quality of science and engineering students, but also stimulate their aesthetic innovation ability, promote the development of their right brain, and enhance their image thinking ability. By using information technology to improve the quality of professional basic courses, our goal is to make students our core and help them achieve comprehensive growth. With the development of science and technology, "only when there is pressure can there be motivation", aiming to improve the informatization teaching level of professional basic courses, so as to better achieve educational goals. It aims to improve teachers' teaching ability, enhance teaching effectiveness, and achieve higher educational goals by establishing a comprehensive information-based teaching evaluation mechanism. For the elderly and teachers with weak information technology application abilities, we should take measures to stimulate their enthusiasm, so that they can use advanced information technology to complete teaching tasks without causing too much evaluation pressure on them. Therefore, we can adopt a shared teaching model or adopt a simplified technology to ensure the high quality and efficiency of teaching activities.

(3) Adjusting the curriculum structure, optimizing teaching resources, and promoting students' self-learning and personalized learning

Using big data technology, universities can conduct a comprehensive analysis of teachers' teaching and students' learning, establish a complete model, and better grasp the teaching content and the interrelationship between different resource modules. Based on the focus of teaching, effective measures can be taken to optimize curriculum arrangements, improve the allocation of teaching resources, and achieve the sharing of high-quality resources, thereby making teachers' teaching and students' learning smoother. Through big data analysis, we can better understand the learning situation of students, including their grades, hobbies, and activity participation. In this way, we can better predict students' future development trends, study their learning patterns, and help them better understand themselves, thereby achieving personalized learning. In this way, students can be better guided to self-learning and personalized learning. In the teaching process, one cannot blindly imitate the methods and behaviors of other institutions and teachers, as there are differences between students. We should proceed from reality and strengthen our understanding and understanding of students by collecting various data in order to better achieve the goal of teaching students in accordance with their aptitude.

(4) Making full use of various information resources to improve the information-based teaching of professional basic courses

"Reducing complexity to simplicity" aims to utilize the advantages of professional and technical talents in science and engineering universities to solve complex technical problems in the informatization teaching of professional basic courses, while "practicing" and "being lazy" can also play a role in achieving better teaching results. With the development of information technology, information-based teaching of professional basic courses has become an important educational model. It not only helps teachers better impart knowledge, but also improves students' learning effectiveness through sharing and discussion. By implementing information-based teaching of public art courses, universities of science and engineering can obtain more learning opportunities, which can effectively improve classroom effectiveness. Therefore, teachers should strengthen communication and interaction with students and establish an effective teaching environment to promote students' learning interest and development potential.

(5) Creating a good campus informatization education and teaching environment

Schools should establish a sound information-based education environment to stimulate students' enthusiasm for learning and help them transform their learning philosophy from "passive acceptance" to "active inquiry". To this end, schools should be equipped with appropriate technical equipment, strengthen the layout of the campus Internet, and combine multimedia computer equipment and network communication engineering with daily educational activities to improve the learning effectiveness of students. Colleges and universities should adjust their curriculum in a timely manner and increase the hours of practical activities in information-based teaching, so that teachers can better grasp the operational skills of information-based equipment, and effectively solve problems encountered in the actual operation process, thereby improving teaching quality. By studying together with university teachers and students, we can stimulate their enthusiasm for learning and be encouraged by universities. In addition, we can invite experts, teachers, and colleagues from all walks of life to come to classrooms to explore the new knowledge brought about by information technology. With the progress of science and technology, new information-based education methods are replacing traditional education models. Among them, the principle of "student centered development" is widely applied in teaching practice, providing teachers with a more flexible teaching environment, which is more conducive to cultivating students' learning ability and autonomy.

(6) Establishing a scientific information-based teaching evaluation and incentive mechanism

By establishing a sound evaluation and incentive mechanism for information-based teaching, teachers can be provided with more reliable guidance, thereby promoting their better implementation of information-based teaching. To this end, a comprehensive student evaluation system should be established to better reflect the actual performance of students, while also ensuring the accuracy of the evaluation and avoiding any form of false or non objective situations. Teachers should actively accept student feedback and insist on using excellent reviews, but they should also timely adjust and improve guidance assessments that are conducive to personal growth based on actual situations. The mutual evaluation between teachers and students can more clearly reflect the shortcomings of teachers in information-based education, thereby avoiding similar situations in future teaching activities. In order to improve the quality of teaching, we have established a reward and punishment mechanism. We use the evaluation results of teachers and students as a part of the evaluation of teachers' teaching results, and use the proportional arithmetic method in the final summary, hoping that teachers with excellent performance, information literacy, and professional knowledge abilities can continue to exert their talents. However, for those teachers who are unwilling to change their behavior, we will severely criticize them to make them realize the importance of information-based education in the construction of universities. Finally, the

leadership of universities should actively introduce advanced information-based education evaluation standards at home and abroad in order to identify deficiencies in internal teaching activities in schools and take effective measures to improve them.

(7) Correctly recognizing information-based teaching and fully reflecting its advantages

With the development of science and technology, information-based teaching has completely changed the traditional teaching mode, providing not only a new teaching method for college teachers, but also a personalized learning experience for students. However, in order to truly integrate big data into the entire process of information-based teaching, university teachers must fully understand and use big data, which is very important. In information-based teaching, teachers need to make full use of two important characteristics, openness and autonomy. Openness means that classroom teaching is no longer limited to traditional classrooms, textbooks, or teachers' professional knowledge and students can gain more perspectives and ways of thinking, expanding their horizons of thinking. Student autonomy is a very important concept, which means that they can independently determine their learning content, time, and teacher. As teachers, we should deeply understand the subjective initiative of students, respect their rights, and provide them with the education that best suits them. We should focus on cultivating their independent thinking abilities, rather than just focusing on their information skills. With the development of big data technology, information-based teaching should give full play to its unique advantages, including rich curriculum content, being student centered, being targeted and practical emphasis. In this situation, university teachers should pay more attention to grasping these advantages and making them more operable, so as to make university information-based teaching more dynamic and achieve a more perfect effect.

(8) Complying with relevant precautions and completing the informatization teaching mode in universities

To better achieve information-based teaching in universities, teachers should make full use of big data technology, strengthen the improvement of teaching equipment, including purchasing computers, projectors, multimedia, etc., to meet the needs of information-based teaching, and continuously improve the quality of teaching with the support of universities. Colleges and universities should strengthen the construction of campus networks, build information-based classrooms, provide more convenience for teachers, and make information-based teaching more practical and effective, so as to avoid only staying superficial and ignoring substantive improvements. With the help of big data technology, we can create a more attractive and practical teaching environment, stimulate students' learning enthusiasm, cultivate their innovative thinking ability, and promote their comprehensive development. To achieve this goal, university teachers need to comprehensively and vigorously use big data, and collect, analyze, and use relevant data to ensure the authenticity and reliability of the data. At the same time, attention should also be paid to avoiding repetition and repeated use in order to maximize the effectiveness of information-based teaching. In order to cultivate new talents in the new era, we must take a series of reforms and efforts, so that students can better learn and grow, without focusing on other aspects.

7. Conclusions

In order to better meet the needs of information-based education and management, universities of science and engineering should change their traditional teaching models and roles, and use information technology to explore new teaching methods to support the cultivation of high-quality skilled personnel. To improve teachers' information-based teaching abilities, universities should hire experts to guide and train teachers, and help them attach importance to information-based education and curriculum development ideologically. This can stimulate teachers' enthusiasm for

information-based teaching, promote the reform of traditional teaching methods and the popularization of information-based teaching, and make all teachers realize that modern information-based teaching is a long-term task. By systematically integrating authentic and effective data and course materials obtained by teachers and students and incorporating them into the information-based teaching management system, we can ensure the completeness of information-based teaching materials, promote data exchange between various departments and between teachers and students, and greatly enhance the scientificity and efficiency of information-based teaching and management in universities.

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