Research on online and offline deep integration teaching mode under the background of new engineering based on Internet +

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Abstract: This paper gives the current situation of traditional classroom teaching in Colleges and universities. Under the background of new engineering, it carries out the research on the deep integration of online and offline teaching mode, effectively improves the overall teaching level and education quality, and provides theoretical support and practical reference for training high-level application-oriented talents.

1. Introduction

On February 18, 2017, the Ministry of Education held a strategic seminar on the development of Engineering Education in Colleges and universities in Fudan University. On February 20, 2017, the Ministry of Education issued the notice on the development of new engineering research and practice, which clearly stated that "Engineering Universities", "comprehensive universities" and "local universities" should carry out new engineering research according to their own characteristics. On June 16, 2017, the Ministry of Education issued the notice on recommending new engineering research and practice projects. On March 15, 2018, the general office of the Ministry of Education issued a Notice of the general office of the Ministry of education on publishing the first batch of research and practice projects of new engineering. On April 2, 2018, the general office of the Ministry of Education issued a notice on printing and distributing the "action plan for artificial intelligence innovation in Colleges and universities", which requires promoting the construction of "new engineering courses". Under the new situation, the reform and development of China's higher education has entered a new historical starting point. It is urgent to speed up the construction of "new engineering subjects". The new economy represented by new technologies, new formats, new models and new industries puts forward higher requirements for engineering science and technology talents. Colleges and universities urgently need to speed up the reform and innovation of engineering education and cultivate a large number of diversified and innovative outstanding engineering and technological talents. The background of "new engineering" puts forward new requirements and standards for personnel training. Therefore, it is imperative to reform the teaching mode of professional courses.

2. Current situation of traditional classroom teaching in Colleges and Universities

Traditional college teaching takes classroom teaching as the main content, and forms a teaching mode with teachers' teaching as the center and teaching materials and teaching aids as auxiliary. This teaching mode makes students in a passive state in the learning process, which is not conducive to improving students' participation and interaction in the classroom, and students' ability of application, analysis and creativity can not be effectively cultivated. And because of the unified teaching content and teaching plan, ignoring the individual differences of students, for the weak students, learning interest is not strong, can not teach students according to their aptitude. In the traditional teaching mode, due to the limitation of teaching time, students accept a large number of new teaching contents in the classroom. After the teacher's explanation, students can only review by impression, understanding, notes and textbook content. The classroom teaching situation can not be

reproduced, which can not provide efficient and reliable review means for students, resulting in students' weak grasp of knowledge points Students will have a sense of burnout and weariness of learning. How to effectively digest and understand what teachers teach is a problem that needs to be solved at present.

Traditional teaching evaluation in Colleges and universities mainly focuses on Teachers' evaluation of students, mainly based on stage performance. The evaluation basis and evaluation information are single and fragmented, which can not realize the comprehensive and whole process evaluation and evaluation of students, which is not conducive to the development of targeted teaching intervention. Therefore, teachers should change the traditional classroom evaluation method, not only pay attention to the evaluation of students' learning effect, but also pay attention to the process evaluation.

Traditional classroom teaching has been unable to meet the needs of interactive learning. With the development of information technology and the popularization of multimedia, network classroom and mobile intelligent equipment, it is an urgent problem for teachers and students to effectively connect in class and after class without the limitation of time and place. We should change "classroom centered" into "both classroom and extracurricular teaching", and explore the establishment of a new teaching mode with learners as the center and the cooperation of teaching and learning.

3. Concept definition

3.1 New engineering

In order to deepen the reform of engineering education, support service innovation driven development, "made in China 2025" and other national strategies, the Ministry of education actively promotes the construction and development of new engineering, and conducts research and practice around the new concept, new structure, new mode, new quality and new system of Engineering education reform.

3.2 Internet +

Driven by innovation 2.0 in the knowledge society, Internet plus refers to the "Internet plus all traditional industries", but it does not mean simply adding the two together. Instead, it uses information communication technology and Internet platform to make the Internet merge with traditional industries and create new development. This topic combines Internet plus traditional education to form an integrated teaching resource system, and create an information-based learning environment based on the three organic space, resource space and social space.

3.3 Online and offline

In this topic, "offline" refers to classroom teaching, "online" refers to the use of "A + Classroom school" Internet platform to publish teaching resources, including video, audio, animation, pictures, text, courseware, teaching plan, etc. In the whole process of teaching design, starting from the actual needs of enterprises, we should not only consider the teaching objectives and teaching contents, but also consider the creation of situations conducive to the construction of students' knowledge, so that students can preview and review at any time without the limitation of time, place and frequency, and can make use of fragmented time for learning and interactive communication.

3.4 Teaching mode

Teaching mode refers to a relatively stable framework and procedure of teaching activities established under the guidance of certain teaching ideas or teaching theories. The structure framework highlights the teaching mode from a macro perspective to grasp the overall teaching activities and the internal relations and functions between the various elements; the activity procedure highlights the order and operability of the teaching mode. The teaching mode can be divided into three types, namely the teaching mode of teachers and students system and the teaching mode of book knowledge, the teaching mode of teachers and students guiding students to learn by

themselves from the activities and the teaching mode of compromise between the two.

4. New engineering background offline online and offline deep integration teaching mode

4.1 Under the new engineering background, the online and offline teaching mode design is based on Internet plus.

Under the background of new engineering, how to effectively digest and understand the content of teachers' lectures, improve their engineering ability and meet the needs of enterprises through various information resource databases is the main problem to be solved in this subject. This topic combines the characteristics of students' diversified learning methods and teachers' teaching methods, and makes full use of modern information technology platform, not only to use "A + Classroom school" On the Internet platform, QQ and wechat groups should be used for effective information exchange between teachers, students and students. This topic constructs the online and offline teaching mode framework from three aspects: before class, during class and after class, as shown in Fig.1.
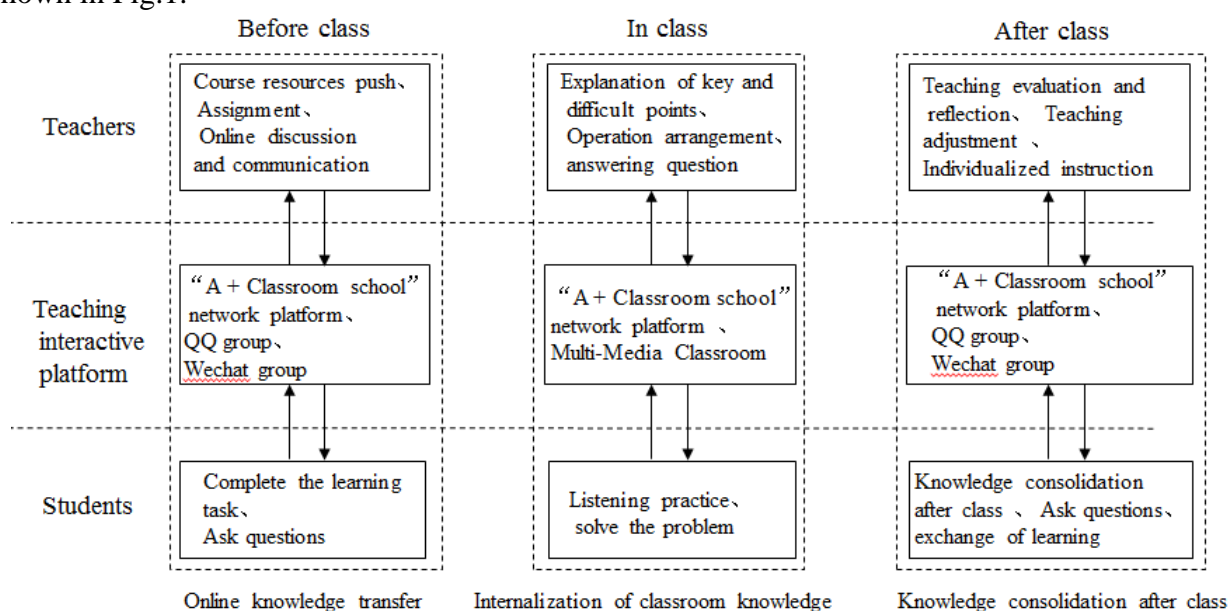
	Before class	In class	After class
Teachers	Course resources push、Assignment、Online discussion and communication	Explanation of key and difficult points、Operation arrangement、answering question	Teaching evaluation and reflection、Teaching adjustment、Individualized instruction
Teaching interactive platform	"A + Classroom school" network platform、QQ group、Wechat group	"A + Classroom school" network platform、Multi-Media Classroom	"A + Classroom school" network platform、QQ group、Wechat group
Students	Complete the learning task、Ask questions	Listening practice、solve the problem	Knowledge consolidation after class、Ask questions、exchange of learning
	Online knowledge transfer	Internalization of classroom knowledge	Knowledge consolidation after class

Fig.1 The framework of the online and offline teaching mode

4.2 Under the background of new engineering, it is necessary to strengthen school enterprise cooperation and realize the integration of production and learning

Under the background of new engineering, cultivating engineering and technical personnel who can really meet the needs of enterprises is the foundation of new engineering construction. Therefore, the teaching of colleges and universities must start from the actual needs of enterprise posts, take the cultivation of students' practical ability and practical application ability as the goal, re integrate the teaching content with the guidance of real enterprise projects, and let students "learn by doing, learn by doing and combine learning with practice" according to the actual enterprise project development process and norms, so as to strengthen the cooperation between colleges and enterprises and realize the integration of production and learning To create enterprise courses and improve the quality of teaching output.

4.3 Building a variety of learning resources based on the Internet plus under the new engineering background.

Under the new engineering background, we build a variety of learning resources based on the Internet plus. The main functions of the "A+ Classroom school" Internet platform include: classroom review, strengthening wrong questions, teacher-student interaction, assignment distribution, micro class learning, student feedback, and online Q & A. Its resource forms include

video, audio, animation, pictures, text, courseware, teaching plan, etc. The resource library cases need to come from the enterprise, pay attention to the deep integration of theory and enterprise engineering practice, the project team members need to go deep into the enterprise for investigation and study. In the early stage, they have entered Shanghai Lingdong Microelectronics Co., Ltd. to collect relevant teaching cases and carry out teaching based on corresponding engineering projects. In the whole process of teaching design, we should not only consider the teaching objectives and teaching content, but also consider the creation of situation which is conducive to students' knowledge construction, so that students can preview and review at any time without the limitation of time, place and frequency, and can use fragmented time to learn and interact, cultivate students' Computational Thinking Ability and effectively improve their work Cheng's practical ability.

4.4 Analysis on the effect of teaching mode implementation

Through the "A+ Classroom school" Internet platform, students can conduct information feedback, truly organically combine curriculum, teaching, feedback, evaluation, etc. according to the learning process and learning effect feedback, help teachers and students revise learning, implement evaluation to promote teaching. In addition, at the end of the course, we conduct a questionnaire survey on students to understand their needs, design and organize online and offline integrated teaching more reasonably, and further explore the breadth, depth and precision of the research.

5. Conclusion

Under the background of new engineering, taking the Internet plus as the goal and the application oriented talents training as the goal, through the integration of production and learning, the project development examples of enterprises are taken as important teaching resources, and the modern information learning method is adopted to break through the time and space boundaries of the classroom, broaden the learning channels, and adopt multiple evaluation methods to build a deep online and offline teaching mode to train students' thinking ability. In order to provide theoretical support and practical reference for training high-level application-oriented talents, it is necessary to improve students' engineering practice ability and effectively improve the overall teaching level and education quality.

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