

# Discussion on the Reform of Teaching Mode of Geographic Information Science Major under the Background of Educational Informatization 2.0

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**ABSTRACT.** *Under the background of education informationization 2.0, the traditional teaching contents and methods for geographic information science majors can't meet the needs of current curriculum informationization construction. How to improve the teaching content and teaching mode of professional courses and improve students' interest and initiative in learning professional courses are urgent problems to be solved. Based on the author's experience in the teaching of this specialty, this paper analyzes the deficiencies in the traditional teaching, and puts forward own views on the content arrangement of the specialty curriculum and the reform of teaching methods.*

**KEYWORDS:** *Education informationization, New engineering, Internet +, Transformation of education*

## 1. Introduction

In April 2018, the Ministry of Education officially released the “Education Informatization 2.0 Action Plan”, which basically realizes the education development goal of “three top universities, two top universities, three new ones” by 2022:

- (1) Three aspects: teaching application covers all teachers, learning application covers all school-age students, and digital campus construction covers all schools.
- (2) Two high: the application level of informatization and the general improvement of information literacy of teachers and students.
- (3) First, we will build an “Internet + Education” platform.
- (4) Three changes: to promote the transformation from special educational resources to big educational resources, from improving the application ability of

information technology of teachers and students to comprehensively improving their information literacy, and from integrated application to innovative development.

(5) Three innovations: Strive to build a new model of talent training under the condition of “Internet plus”, develop a new model of education service based on “Internet plus”, and explore a new model of education governance in the information age.

Based on this development goal, under the promotion of educational informationization 2.0, the specialized course education and teaching in colleges and universities have been exploring various educational reform modes, so as to cultivate talents with educational informationization and new engineering specialty, better adapt to the development of The Times, and serve all fields of social construction.

Taking the geography information science (hereinafter referred to as “GIS”) major of new engineering major of Shandong Jiaotong University as an example, this paper explores the reform and practice of specialized course education mode under the background of educational informatization 2.0.

## **2. Necessity of Teaching Mode Reform**

The courses of GIS major are theoretical, practical and applied. The teaching objectives are based on theoretical knowledge, and the theoretical knowledge is applied into practice to achieve the goals and tasks. The traditional teaching mode of specialized courses is based on theoretical knowledge teaching, with teachers speaking in class and students listening. In view of the limitation of class hours of specialized courses, this teaching mode can be described as “spoon-feeding teaching”. For students, what they do not understand or master in class cannot be looked back and consolidated. As a result, they accumulate more and more contents they do not understand and eventually lose interest in learning. As a result, they lose concentration in class, have poor learning initiative, play mobile phones and even skip classes. The lack of theoretical knowledge in practice leads to a low degree of participation and low level of enthusiasm. In turn, teachers have no sense of achievement in teaching and their enthusiasm in class is affected. Therefore, in the era of educational informationization 2.0, the traditional mode of specialized course education is in urgent need of reform.

## **3. Discussion on the Reform of New Teaching Mode**

In order to improve the enthusiasm of students in learning specialized courses, promote the informatization construction of specialized courses, and enhance the sense of achievement of teachers in teaching, our school has carried out the reform of the educational mode of specialized courses, and achieved certain results. The details are as follows:

### ***3.1 Design Teaching Content Rationally***

The curriculum theory of GIS major is based on strong practicality, with relatively more knowledge points and more content to be understood and mastered. In view of this characteristic, the teaching content of specialized courses should be designed reasonably with prominent emphasis, so that students can master the knowledge system more clearly, define the teaching objectives, and avoid covering all aspects of the teaching content. The key point is often the difficult point of the course. Teachers can focus on teaching this part of the content, and try to make students know it and why. For some non-key content, or other professional courses have been taught in the content, can be briefly mentioned or students after class self-study. If the design of teaching content cannot be highlighted and all knowledge points are taught in a balanced way, students are likely to have an understanding that knowledge points are or are not key points, which will inevitably lead to a straightforward teaching process with no prominent key points and predictable teaching effect.

In addition, for some teaching contents, related videos and actual project implementation process and methods contacted by teachers can be combined to design, so as to achieve the integration of project-driven and production-teaching, and promote practice with theory and theory with practice.

### ***3.2 Make Full Use of the Information Teaching Platform***

Under the background of education informatization 2.0, teachers make use of modern educational technology and combine various teaching platforms to carry out teaching process.

#### ***(1) Online teaching platform***

The educational administration department of the school provides an online teaching platform for teachers and students. Teachers can upload all kinds of teaching resources, such as courseware, lesson plans, videos and other teaching reference materials, and students can download and learn by logging in their accounts. Teachers can also assign relevant homework and discuss group topics on the platform. The student Affairs Section will upload homework, discussion process and results of topics. Students and teachers can interact on the platform, and teachers can monitor students' learning and participation.

#### ***(2) Online courses***

Courses applied for online course project, the teacher will in-class teaching process recorded, uploaded to the related website, students can consolidate classroom teaching content at any time, for you can give classroom failed to understand the content of the master class, students can learn to watch over and over again, until fully grasp, avoid the traditional courses can't again to learn after the disadvantages of the teaching process.

#### ***(3) Make full use of MOOC and Micro-class platforms***

Many courses have applied for the micro-MOOC teaching reform project. For the independent knowledge points in professional courses, the course teacher records videos and posts them on MOOC and micro-course platforms, so that students can download and learn at any time.

(4) Make full use of the course learning group

For the teaching of specialized courses, each course has a course learning group. The teacher releases the teaching materials to the learning group, and students can download and learn at any time. At the same time, if students have any questions about the teaching content, they can consult the teacher at any time through the learning group to realize one-to-one online tutoring.

### ***3.3 Reform Teaching Methods***

In order to avoid the traditional “spoon-feeding” teaching, teachers should always pay attention to reflect the systematicness and completeness of the teaching process in the teaching process, combine theory with practice, and guide students to learn to connect knowledge points.

(1) Training classroom teaching

Letter to the content of the course teaching contents involve hands-on practice more, pay special attention to in the process of teaching to strengthen students' practical operating ability, improve the level of students' operation, on the teaching methods, combined with the comprehensive case more, skills training to the student, will teach the teaching process into skills training model of classroom teaching, let students themselves according to the theoretical knowledge to analysis case material, put forward the method to solve the problem. In the allocation of teaching time, more time should be given to students for training and practice, and the teaching time of teachers should be reduced on the basis of ensuring the teaching quality.

(2) Heuristic classroom teaching

In the process of teaching, we should give play to the students' subjective initiative, make them move and give them the initiative in learning. The pre-lecture content is discussed before class, and the teacher guides the students according to the situation, gives inspiring thinking thoughts, and leads the discussion to a deeper level. Students become the main body, give full play to each student's subjective initiative, actively participate in the discussion of issues. In the end, the teacher summarizes the evaluation, so as to change the traditional “indoctrination” teaching. This method can not only improve the enthusiasm of students to learn, but also make students feel that they have learned something.

(3) Open experimental courses

Under the background of “Internet + education”, a simulation laboratory and GIS & RS laboratory have been built, equipped with all kinds of professional software and hardware, such as relevant GIS software, image processing software, UAV, etc. Specialized courses make full use of experimental equipment for internal and

external industry experiments. Combined with modern multimedia, virtual reality and other technologies, the network simulation experiment is made. After logging into the system, students can conduct simulation experiment through online mode, so as to better consolidate the theoretical content. Teachers can also be assessed online.

In addition, teachers of relevant majors offer certain open experimental courses every semester, and students who are interested can observe and study in no major.

(4) Course design and internship

After the course content is taught, comprehensive course design or internship will be offered for one to two weeks. The instructor gives the corresponding comprehensive design topic, and the students can discuss alone or in groups, complete the design or internship task, and the teacher makes comments and analyses, so as to improve the students' ability of comprehensive analysis and problem solving.

(5) Actual project training

Teachers apply their related projects to classroom teaching in a reasonable way, so that students have the opportunity to get in touch with practical work projects. Excellent students can be absorbed into the research process of the project, so as to better improve students' ability of practical project work and lay a good foundation for better integration into the enterprise in the future.

#### **4. Conclusion**

Through the above series of reforms, combined with our new engineering construction requirements, security measures such as to take classes of all kinds of information construction, implemented the school letter based on the "Internet +" professional curriculum education service mode, according to the specific implementation process and effect, to enhance the students' interest in study and the subjective initiative, improved its ability to find and solve problems, the effect of classroom teaching has the obvious improvement, promote the education informatization in the age of 2.0 the construction of "new engineering + wisdom campus".

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