Exploration the Information Reform of Majors Partition Process

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Abstract. Majors partition is an important task in the universities. At present, Most of the partition process is completed by manual diversion, which is heavy, time-consuming, easy to make mistakes, and low efficiency. The paper explored the Information reform of majors partition process of the universities which realized the informationization of filling voluntary, diversion of major information and division of professional classes, and to discuss the majors partition admissions algorithms and professional division admission algorithms. It has solved the practical problems of diversion work in universities, and has reduced mistakes, saved labor and saved time.

Introduction

With the development of economic globalization, social demand for talents is diversified. Higher education enrollment and training mode is also constantly reforming, "wide caliber, strong foundation, strong ability, high quality" is gradually recognized. In this context, "enrollment in large categories, diversion training" was first proposed by Beijing University¹-² in the late 1980s. Since then, pilot projects have been carried out in Tsinghua University, Beijing Normal University, Fudan University, and gradually extended to other colleges and universities throughout the country ³-⁴. The mode of "enrollment in large categories and diversion training" is mainly divided into three stages. The first stage is for college entrance examination candidates to fill in the major categories, each university according to the major categories of enrollment and admission stage; the second stage is for the university major general education stage; the third stage is for the major categories of diversion, students into specific professional in-depth learning stage ⁵-⁶. This paper mainly discusses the informationization reform in the third stage, and provides technical support for the further promotion of the mode of "enrollment of major categories and diversion training" in Colleges and universities.

The Process Analysis of Majors Partition

The time of diversion of major categories is usually at the end of the second semester. There are three steps. The first step is to fill in the specific professional volunteers in the major categories according to their own preferences for the major and credit points. Secondly, schools (colleges) determine the number of specific professions and divert major categories according to the actual situation of school. The third step is to determine the number of professional classes and classify the specialties according to the results of large-scale diversion.

At present, many colleges and universities also adopt manual shunting in the process of major shunting. Its drawbacks are large workload, more teachers, time-consuming and easy to make mistakes ¹⁰-¹³. Process intelligence utilizes computer programs to complete complex professional divergence processes, which can reduce workload, save cost, save time and be less mistakes¹⁴-¹⁵. Next, the paper explores how to realize the informationization of the process of major class shunting, designs the algorithm of major class shunting and the algorithm of professional class
shunting, develops the informationization software, and applies the software to the actual process of major class shunting, and analyses the effect of the reform.

Process Informatization of Major Categories

The informatization reform of the diversion process of major categories needs to be realized in three aspects: the informatization of students' voluntary application, the diversion informatization of major categories in schools, and the informatization of major classes in schools.

Informatization of Application

All majors are displayed on the website for students to choose and fill in. Students are not allowed to alter the major code or name. Students need to fill in the following information: major, student id, class, name, first choice, second choice, third choice, fourth choice, fifth choice, password, etc. After completion and submission, the information of students' voluntary will be saved in the database server, which provides data for the later classification and classification of major classes.

Major Categories of Triage Informatization

There are two main algorithms of professional diversion. The one is score-first admission algorithm. The students who get high scores are the volunteers, and then they are admitted in turn according to the volunteers they filled in. Another is the voluntary preference admission algorithm. The first volunteer students are enrolled, and then they are enrolled according to the ranking of scores. This paper focuses on the second kind of shunt algorithm.

The priority admission algorithm for student volunteers is described as follows:

Step1: descending order of students according to students' volunteers and grade point.
Step2: get the Nth student's first choice, and pre-admission, do not save, only record in the control, N starts from 1;
Step3: add 1 to the number of volunteers;
Step4: judge whether the voluntary pre-admission has been recorded. If not, get the record of the next student; otherwise obtain a professional overenrollment voluntary collection;
Step5: get the record of the Mth excess volunteer student. Starting from M, get the student's next volunteer;
Step6: judge whether the volunteer has been fully enrolled; if so, obtain the student's next volunteer; otherwise, record the admission status of the student;
Step7: subtract 1 from the excess voluntary collection;
Step8: judge whether the extra volunteers have been allocated, If not, add 1 to the student record. Otherwise, go to the next step;
Step9: obtain triage result in control, save one by one to database, end.

Informatization of Professional Classification

There are two major admission algorithms. The one is to segment according to the score from high to low; the other is to segment according to the score from high to low. When dividing the interval, we can use the professional classification Admission Algorithm of first order and then inverse curve, or the professional classification Admission Algorithm of straight line. This paper focuses on the introduction of curve specialty classification admission algorithm.

Curve major grading algorithm is described as follows:

Step1: select a major, and rank all students in the major in descending order according to their grade point, and select the class number direction for forward operation;
Step2: get the Nth student record, N starts from 1;
Step3: judge whether the number of class has exceeded, if so, end the class division; otherwise go to the next step;
**Step 4:** judge whether the number of classes has exceeded, if so, operate in the opposite direction of the number of classes, clear the number of classes, add 1 to the number of classes, and subtract 1 from the number of student records; otherwise go to the next step;  
**Step 5:** save the classification result and add 1 to the number of classes;  
**Step 6:** judge whether the class classification is over, if not, obtain the next student record; otherwise end the program.

**Conclusion**

Applying the ideas and methods of professional diversion informatization to the practical professional diversion management, the results show that all the professional diversion work is carried out with the assistance of the informatization of the diversion process, which reduces the workload, saves time and reduces mistakes. First, the number of teachers participating in the diversion work of major categories has been reduced, and there is no longer a need to fill in a large number of forms to record the students' voluntary filling, analyze the results of the diversion work of major categories, and make statistics on the results of professional classification. Second, it saves a lot of time. The work that could be finished in two or three weeks can now be finished in two or three days. Three is to reduce the work error, the original manual operation, the task is large, but also prone to error, now only gently, the computer program will automatically complete, do zero errors. The informationization reform of the diversion process of major categories has greatly improved the work efficiency and achieved good reform results.

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