

# *Teaching Reform Based on Systematization of Working Process*

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**Abstract:** With the deepening of education reform in China, many colleges and universities have carried out teaching system reform, in which the work process is an important research direction. This paper mainly analyzes the problems existing in the current school management system from the aspects of informatization based work process, flexible autonomous learning, and students' active inquiry, and puts forward relevant improvement measures and future development trends and prospects, with the goal of promoting teachers to play a leading role in the classroom and improving students' participation to improve their professional skills, Make it adapt to the social needs and the transformation direction of talent training mode in the new era. After that, based on the systematization of the working process, this paper designed a teaching reform model and carried out a functional test of the model. The test results showed that the overall running time of the teaching reform model based on the systematization of the working process was about 15sz, and the running time of the student duplicate checking module was about 5s.

## **1. Introduction**

With the development of the times, the traditional teaching mode can no longer meet the requirements of the current personnel training and management work in the process of work, and the realization of this new teaching mode is to constantly update and improve the existing teaching science curriculum system on the basis of reform and achieve good results. Therefore, we must strengthen the improvement and perfection of the curriculum system and curriculum content innovation, and fundamentally change many problems in the current school management [1, 2].

It is not difficult to find that foreign universities are relatively mature in teaching mode, management system and means of analyzing the research status quo of teaching process informatization at home and abroad. However, due to the late start in China, attention is not enough. At present, some large and medium-sized schools in China have established a student-oriented integrated curriculum system. However, these systems have not been fully developed and have not been promoted and applied. In addition, with the development of economic globalization and the deepening of educational reform, many enterprises have begun to position themselves as international talent training bases [3, 4]. Some scholars put forward the idea of "developing based

on computer network technology" and pointed out that with the continuous improvement of science and technology in the information age and the promotion and application of new ideas in the field of education, it has become an inevitable trend, which requires us to innovate and change from the traditional teaching mode. Therefore, based on the systematization of the working process, this paper studies the teaching reform.

With the development of modern information technology, the traditional teaching model can no longer meet the needs of the current college students to improve their learning ability. Therefore, during curriculum reform, new educational methods, methods, and concepts should be realized. This paper focuses on the work process and the integration and utilization of information resources. First of all, it analyzes the current situation and existing problems of information-based teaching for teachers in colleges and universities in China. Then it puts forward suggestions on building a "double qualified" high-quality curriculum system based on information sharing platforms and improvement measures, and looks forward to the future development trend. Finally, it summarizes the summary of the full text and makes a reasonable and effective discussion and outlook on the further optimization of the teaching model of college reform.

## **2. Discussion on Teaching Reform Based on Systematization of Working Process**

### **2.1. Systematization of Teaching Process**

The systematization of the teaching process is to integrate the work process and the course content to achieve the expected goal. Based on the work process, the courses are classified according to certain requirements, and the corresponding learning tasks are established. The analysis is made through the students' completion of homework, the teacher's teaching effect, and the classroom atmosphere. In this process, teachers, students, and classmates should communicate with each other. Through this interactive way to promote the emotional two-way transmission of information between teachers and students, teachers can also understand what each person needs to do to maximize the benefits and improve their satisfaction, to better help students to build systematic knowledge and complete the corresponding curriculum tasks. Finally, the expected teaching effect is achieved [5, 6]. Under the traditional concept, we believe that teaching and learning should be developed and integrated at the same time. However, with the rapid development of modern society and the continuous deepening of quality education, the implementation of reform has become increasingly powerful. Therefore, the systematization of the teaching process has become a new trend. The "curriculum system" based on the work process is no longer one sentence can not be separated. The so-called systematization of the teaching process is to abstract the work process from one to several specific processes, refine it for each person or link, and achieve this goal through each step of operation. According to the task type, completion time, and quality, the teacher should make reasonable arrangements for the curriculum, and then the teacher should assign a learning group. Finally, the role of each group member in teaching should be determined according to the curriculum requirements. All these require teachers to consider how to mobilize the enthusiasm of each student in the whole process. According to the previous analysis of the factors that affect the learning effect of teachers and students, there are mainly the following two aspects [7, 8]. The first aspect is reflected in the fact that the various parts of the student work process are interrelated and have a certain degree of collaboration. The second level is the combination of coordination and cooperation to form a harmonious atmosphere. In course teaching, teachers should design, construct, and implement the teaching system with the "guide" as the core. The second is to evaluate the students' achievements. Finally, feedback on learning achievements. Students can publish their required knowledge in the whole classroom and give certain rewards or praise after obtaining the corresponding results. Teachers ask them to think about how to better understand the

knowledge they have learned through classroom activities, to constantly improve themselves, promote the improvement of teaching quality and work efficiency to complete the curriculum tasks.

## 2.2. Existing Problems in Teaching Reform

The teaching process is the dynamic change of students' learning ability, thinking ability, and teachers' quality. In the traditional classroom, because the teacher's teaching method is single, the teaching plan is the center. In the information age, the new teaching mode requires the reorganization of work process and time. However, at present, colleges and universities are still at the exploratory stage and lack experience in curriculum development. At the same time, they have not established a set of systematic workflows and corresponding resource libraries to manage students' learning process and resources and improve teachers' quality. The process of teaching reform is carried out under the joint participation and cooperation of teachers and students, rather than simply teaching by teachers. It is also different from the traditional interaction between teachers and students in the classroom [9, 10]. First of all, students are not interested in learning. In traditional courses, teachers mostly teach knowledge and master skills in the form of lectures, which can not meet the requirements of current quality education for talent cultivation; the second is that the teaching mode is single, boring and has no new ideas, which leads to the fact that most schools do not attach importance to the new work process reform, so that they lack enthusiasm in the actual implementation and can not adapt to the market demand. The teaching process is an important part of students' learning knowledge. In the traditional teaching mode, teachers often put all contents taught in the classroom together and do not arrange each lesson reasonably. This practice has led many teachers to focus only on their own teaching plans, teaching methods, and learning methods and neglect the curriculum itself. At the same time, it is also ignored that what is involved in the new teaching idea after the curriculum is systematized is the relationship between students and teachers and the change of learning objectives. Secondly, in the teaching process, teachers often only focus on whether knowledge points can be reflected in the classroom [11, 12].

## 2.3. Duplicate Checking of Students' Homework

Students' homework duplication check refers to whether the work done by teachers is correct and reasonable, and whether it meets the requirements of the syllabus in the process of completing tasks for students. If errors are found or important, knowledge points are omitted. It needs to be corrected in a timely manner. For students who cannot accurately master the learning process of this class and the requirements of this part of the course, they should immediately focus on the investigation. If necessary, they should propose written criticism and record measures to urge teachers to take seriously the completion of students' homework and skillfully use the knowledge learned in the class, to avoid invalid homework and taking notes. The duplicate checking of a student's homework refers to the checking of all spare parts of the work that has been completed, including those that have been submitted and those that have not been submitted, and the recording, analysis and sorting out of them through the use of computer technology and means. The first thing to do is to determine the task. In traditional teaching, teachers usually put their courseware on the computer and input it into the database. Although this method can ensure sufficient information without missing data or errors, it has the disadvantage that it is unable to comprehensively check and evaluate the quality of students' homework, and it is impossible to effectively monitor and manage because it is a manual input file. Text Rank algorithm is the core algorithm of student homework duplicate checking. The text rank algorithm model is represented as a directed weighted graph  $G=(V, E)$ , where  $V$  is the abbreviation of vertex to identify the set of vertices in the graph, and  $E$  is the abbreviation of edge to identify the set of edges in the graph. For any two points  $V_i$  in the graph, the weight  $W_{ij}$  on the

edge between  $V_i$ . In the directed graph  $G$ , any point  $V_i$  points to the point set of the store to form  $In(V_i)$ , and the point set of  $V_i$  points to form  $(V_i)$ . The score of  $V_i$  is defined in Formula 1.

$$WSV_i = (1-d) + d * \sum_{V_j \in In(V_i)} \frac{W_{ij}}{\sum_{V_k \in Out(V_j)} W_{ij}} WS_j \quad (1)$$

$W_i$  represents the weight between  $V_{ij}$  and  $V_i$ , and  $d$  represents the probability of pointing from a specific point to any other point in the figure, generally 0.85.  $W_{ij}$  represents the weight value Similarity ( $S_i, S_j$ ) of the  $V_i$  to  $V_j$  sides. If the similarity between two sentences is greater than the given threshold, they are considered semantically related and connected, that is, the weight value  $w_{ij}$  of the side. The formula for calculating  $w_{ij}$  is shown in Formula 2.

$$Similarity(S_i, S_j) = \frac{|t_k \vee t_k S_i \wedge t_k S_j|}{\log(|S_i|) + \log(|S_j|)} \quad (2)$$

All points in the digraph need to be initialized with a value before calculation, and then stop iteration when the error approaches to a value less than a given probability value.

### 3. Experimental Process of Teaching Reform Based on Systematization of Working Process

#### 3.1. Teaching Reform Based on Systematization of Working Process

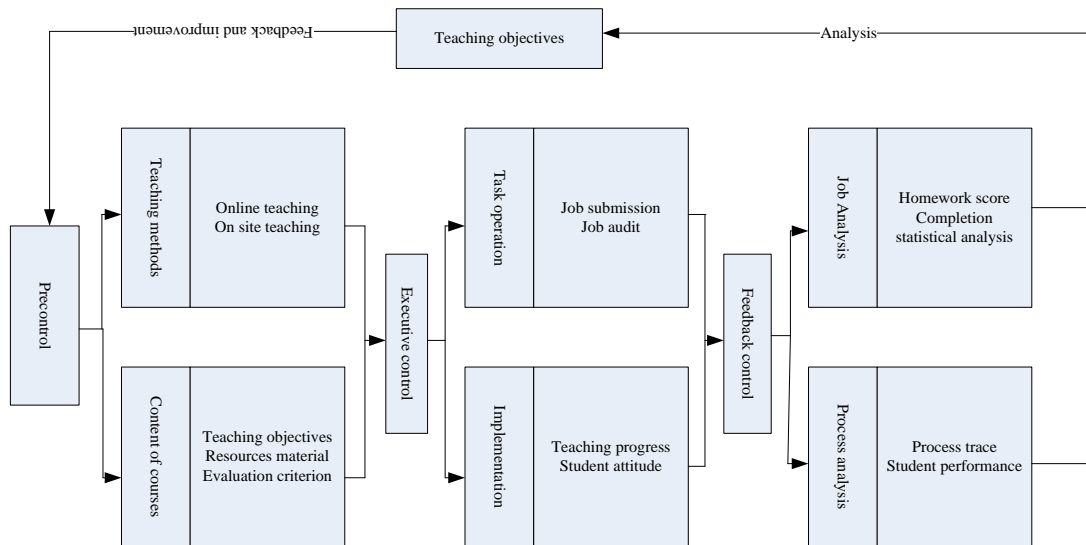


Figure 1: A teaching reform model based on a systematic working process

Through the systematic teaching reform model of the working process (as shown in Figure 1), the three stages of traditional teacher teaching, student learning, and classroom teaching can be organically integrated to form a whole. In the whole curriculum system, it includes knowledge point explanation and learning goal design, knowledge point analysis, and learning method selection. The teacher first determines the task difficulty and requirements according to the skill level that students have mastered, and then assigns task lists of different levels to each group (such as the teaching content of professional basic theories required in compulsory courses), and achieves the final goal by completing the corresponding assignments through independent cooperation. The teaching process is systematized to optimize the workflow, so that students can master the knowledge in a complete and orderly learning environment. This new model of curriculum reform requires teachers

to design teaching content and establish a teaching framework centered on "teaching" from the perspective of traditional educational concepts and ways of thinking. From the perspective of teacher role change, teachers need to fully understand the learning situation, let them know what they have learned in class through practical activities, and apply it to their own learning process. The optimization of the teaching process is a dynamic system, not a static, fixed and unchanging one. Therefore, both students and teachers must be fully considered when designing the curriculum. The traditional "full room" education model can no longer adapt to the current social development requirements of talent training and reform direction. The new modern distance learning mode has become one of the trends of future school classroom teaching reform. Therefore, in the actual implementation, it must be guided by learning, and students and teachers must participate in teaching activities together.

### 3.2. Functional Test of Teaching Reform Based on Systematization of Working Process

In view of the problems that teachers have in the classroom, we need to manage their teaching process, to improve the teaching quality. First of all, teachers put forward the requirements of the new curriculum standards, students' conditions, class hours, and other information in the pre-class preparation stage. Secondly, according to these basic data, we can analyze which content can be solved by using traditional teaching systematic technology, and then take the problems between students and teachers at different levels and between different knowledge points as the key research object to design and improve, and further deal with the mistakes or imperfections in the teaching process.

## 4. Experimental Analysis of Teaching Reform Based on Systematization of Working Process

### 4.1. Functional Inspection and Analysis of Teaching Reform Based on Systematization of Working Process

Table 1 shows the functional test data of the teaching reform model.

First of all, students need to make independent planning according to the actual situation and teachers' personal understanding in the learning process. Secondly, the curriculum task is completed through the cooperation between teachers and the systematic teaching reform model of the working process. The third is to bring the traditional education method into the network virtual classroom and realize the functions of teacher-student interaction, resource sharing, and information exchange by using the "Internet+" technology. At the same time, modern information technology can also be used, such as video conference, micro lesson production, etc. Finally, timely evaluation and improvement are needed in the feedback link of learning achievements. It can be seen from Figure 2 that the overall running time of the teaching reform model function based on the systematization of the working process is about 15s, and the running time of the student duplicate checking module is about 5s.

Table 1: Functional test of teaching reform model

Test times	Teaching model running time(s)	Student homework recheck module running time(s)	Education reform model work efficiency(%)
1	15	3	89
2	18	6	95
3	14	5	85
4	16	3	86
5	15	5	84

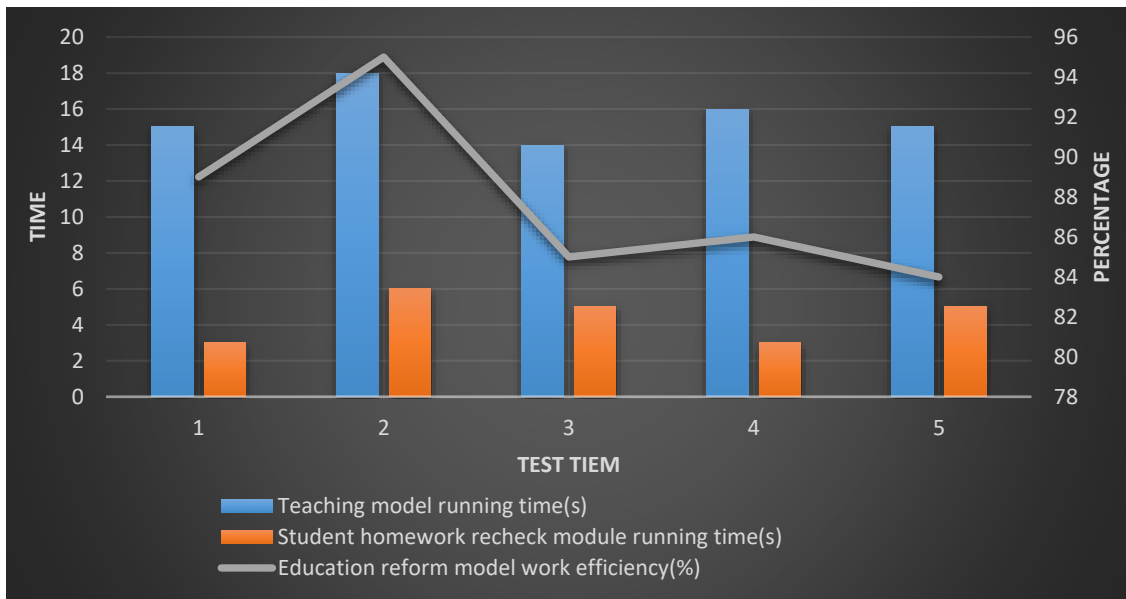


Figure 2: Teaching model performance test.

## 5. Conclusion

In the traditional teaching mode, the dominant position of teachers can not be mobilized all time, and the dominant position of students has not been truly reflected, resulting in low classroom efficiency. Based on this background, a new and efficient workflow reform system, which meets the needs of modern education development and can realize the interaction between teachers and students and the sharing of learning achievements, came into being. This paper will systematically analyze the informatization of the curriculum management process under this new form and propose an improvement plan to carry out research for improving teaching quality. Starting from the role orientation of teachers, the teaching effect will be improved by building a "student+teacher" teaching classroom model.

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