



# Allocation of Teaching Resources in Distance English Education Based on Multiple Constraints Model

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**Abstract.** The construction of English teaching resources of RTVU in distance and open education is an important part of the teaching work of RTVU, including English teaching materials, multimedia, network courses and other hardware and software related to English teaching. Strengthening the construction of English online teaching resources of RTVU in distance and open education is an important aspect to improve the effect of English Teaching in RTVU. This paper presents a database optimization query method based on multiple constraint model. Classify the data in the distance education database, and divide the information in the database into several different categories according to the data characteristics, so as to provide an accurate data basis for database optimization query. Establish a variety of constraint model, judge the data categories that meet the query conditions, and query the data according to different data categories, so as to realize the optimal query of the database. The experimental results show that this algorithm can effectively improve the efficiency of database information query in distance education.

**Keywords:** Distance development education · English teaching · Resource allocation · Constraints

## 1 Introduction

TVU is an open university. It takes distance multimedia teaching as the main means. The English Teaching of modern distance open education is that students send course materials to students through technical media and use two-way communication facilities to provide support services for students' distance learning [1]. This is a multimedia English teaching mode combining teacher guidance, students' autonomous learning and media assistance. In this teaching mode, teachers, students and media are the three basic elements of the whole teaching process [2]. Among these three elements, teachers should give full play to their leading role. Students are the main body of learning and the media is the basis of students' Autonomous Learning [3]. In the process of teaching mode exploration and practice, these three basic elements contain factors that restrict the smooth construction and implementation of the teaching mode of Distance Open Education [4].

First of all, from the point of view of teachers' elements, although distance open education is a kind of autonomous learning form based on the network, which lists the carriers and learning means of women's broadcasting with many flavors, the role of teachers is not weakened, and the tasks are heavier, and they undertake many functions such as teaching knowledge, designing schemes, guiding learning, organizing and motivating students [5]. These functions are more extensive, complex and arduous than traditional teacher functions [6]. Under this English teaching mode, teachers themselves have to complete a transformation, that is, from the preacher and interpreter of the ready-made knowledge system to the assistant and friend of students' self-study, and to be the true mentor of students, so as to guide, design, organize and motivate students to successfully complete their studies [7]. This puts higher demands on teachers. Teachers engaged in distance and open education teaching should have a more comprehensive knowledge structure, master more English teaching skills and interpersonal communication and coordination skills, have lofty moral quality and excellent hard work style [8]. Distance open education in RTVU has many levels of schooling, flexible specialty setting and fast curriculum turnover, so it is impossible to have all full-time teachers. It is the goal of the construction of distance education teachers in RTVU to cultivate versatile talents with one specialty [9]. Viewing the reality of RTVU, it is still a very arduous task to establish a team of high-quality teachers who can adapt to English teaching in distance and open education, which cannot be solved in a short time [10]. Therefore, the previous teaching mode of mailing teaching materials and regular face-to-face teaching by teachers can no longer meet the needs of English teaching in modern distance education, and a new English teaching mode must be explored. Secondly, from the perspective of students' elements, students' autonomous learning, students' learning groups' mutual learning and teachers' teaching guidance are the three basic ways for students to learn in distance open education [11]. Among them, autonomous learning is the foundation of all learning activities and the most important. With the development of modern information technology, modern distance open education has become a new form of education. Under the environment of open distance education, the construction of online English teaching resources in modern open distance education of RTVU is a key problem that must be solved vigorously [12]. Since RTVU launched modern distance open education, it has accumulated some experience in building online English teaching resources, but there are still many problems and deficiencies. This paper discusses the further improvement of online teaching resources construction and English teaching practice in modern distance and open education of RTVU.

## **2 Analysis of the Current Situation of the Construction of English Teaching Resources in Distance and Open Education**

### **2.1 Problems Existing in the Construction of English Teaching Resources for Distance and Open Education**

While obtaining phased development achievements, there are still many problems and deficiencies in the construction of online teaching resources of Modern Distance Education in TVU. Analyzing and solving these problems as soon as possible is an urgent task for the further development of Modern Distance Open Education in TVU.

(1) The application of online teaching resources is not enough

In the existing online teaching resources, most courses are still based on the simple reproduction of text teaching materials or teachers' speeches, which facilitates students' "learning", but ignores the function of "guiding" students, or the function of "guiding" is not strong, and can not "teach people to fish" well through the provision of online teaching resources.

(2) The dynamics of online teaching resources is not strong

Teaching and learning is a dynamic process. Learners are full of questions at any time in the learning process and hope to be solved in time. Most of our online teaching resources appear in static form, which is difficult to reflect the "interaction" between teachers and students in classroom teaching. Static things can meet their basic needs for learning, but they can not meet the new needs generated in their learning process. In other words, there are too few things to meet students' personalized learning needs. From this level, there are still too few online courses.

(3) The integrity of online teaching resources is not enough

At present, the division of online teaching resources by major is considered, but the construction of curriculum teaching resources is lack of integrity. The three-level teaching platforms pay attention to the online learning resources of compulsory courses and some limited courses in the teaching plan, but there are few teaching resources of elective courses and centralized practice links (such as graduation thesis, graduation design, academic thesis, social investigation, production practice, etc.).

(4) Weak supervision of online teaching resources

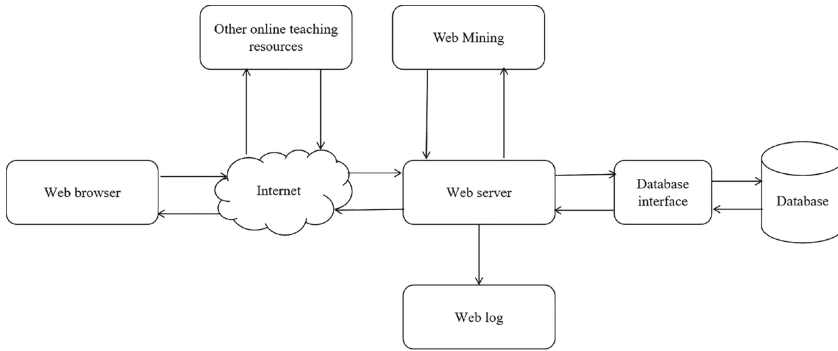
With the deepening and development of Modern Distance Open Education in TVU, there are more and more majors and courses, which puts forward higher requirements for the construction of online teaching resources. However, in the construction process of some curriculum resources, there are often many errors due to poor supervision and evaluation, and these errors are spread to the Internet.

(5) The feedback of online teaching resources is not smooth

After the construction of online teaching resources has been completed and put into use, most of them lack regular quality tracking and information feedback, so it is difficult to find various problems objectively existing in online teaching resources, let alone targeted solutions and improvements.

(6) The complementarity of the three-level teaching platform is poor

At present, the national RTVU system uses a three-level network teaching platform. Theoretically, the three-level teaching platforms should perform their duties and responsibilities to realize the complementarity of the three-level teaching platforms. However, the actual situation is the repeated construction of thousands of schools (classes), and the complementarity of the three-level platform can not be reflected. The distance education model based on Web Mining is shown in Fig. 1.



**Fig. 1.** Distance education model based on Web Mining

## 2.2 Problems Existing in the Current Co Construction and Sharing Mechanism

- (1) The awareness of co-construction and sharing is still relatively weak. The popularity and profundity of the idea of co-construction and sharing of English teaching resources is the primary factor that affects the current co-construction and sharing of resources. Without a deep understanding of the idea of co-construction and sharing of resources, it is impossible to realize that co-construction and sharing of teaching resources is the requirement of building the core competitiveness of RTVU, and it is impossible to realize that co-construction and sharing is the core of open educational resources, and other measures of co-construction and sharing can not be really implemented, let alone continuously enrich and enrich our teaching resources. Because distance education has been carried out in China for a short time, people's understanding and knowledge of it is not deep enough. Because the awareness of co-construction and sharing is weak, it will not attract attention, or even not understand at all. At the same time, there is no clear organization and management organization in the co-construction and sharing of resources in RTVU system of our city, which has influenced the understanding and popularization of this concept to a certain extent, and also made the construction of a perfect co-construction and sharing system of teaching resources become empty talk.
- (2) Lack of complete English resource construction standards for distance education. Due to the short time of distance education in China, many standards are still being formulated and explored, and the standards in resource construction are not perfect, even not formulated and published, let alone popularized, which makes many developers have no clear direction when developing resources, and the degree of standardization of developed resources is not high, making it difficult to realize sharing.
- (3) Lack of a unified management platform. To do a good job in the co-construction and sharing of resources in the region of our city, a management platform with perfect functions and good expansibility is indispensable. Without a unified management platform, it is impossible to understand and master the situation of resource construction and application in the whole province, to fundamentally put an end to the

repeated construction of resources and to fundamentally improve the overall level of resource integration in our city.

- (4) The ability and level of technical support need to be strengthened and improved. Resource construction is a systematic project with high technical content, and the rapid development of computer technology brings some difficulties to the technical support of resource development. The technical strength of RTVU system is not balanced enough, and its level is uneven, which has caused certain obstacles to the regional cooperation and development of resource construction, which also affects the enthusiasm of some teachers' resource construction.
- (5) Lack of funds and practical long-term incentive mechanism. No matter the technical platform on which resources are developed or operated, a great deal of financial support is needed. However, RTVU has no special financial support for resource construction, all of which comes from RTVU at all levels. However, RTVU's own economic strength is weak, so it is impossible to provide strong support for the co-construction and sharing of teaching resources. Because the concept of co-construction and sharing is not popular and profound enough, especially English teaching resources, there is less investment in this aspect, which also hinders the co-construction and sharing of resources to a certain extent. The organizational structure of the distance education system is shown in Fig. 2.

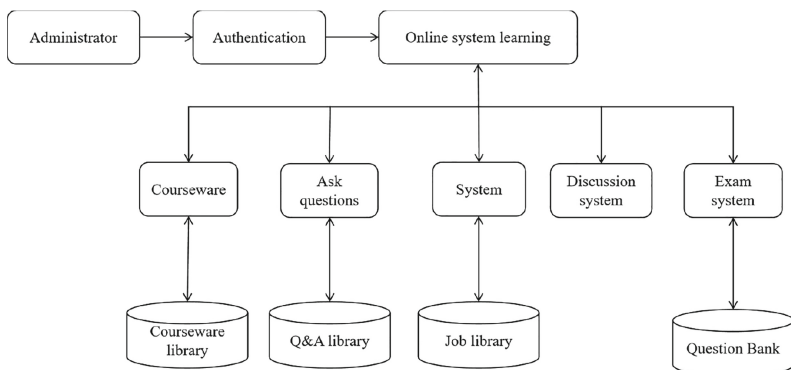
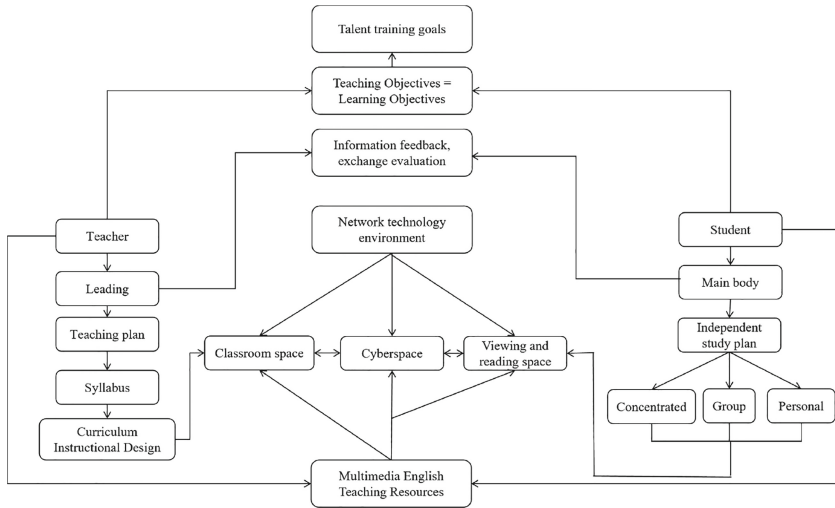


Fig. 2. Organizational Structure of Distance Education System

### 3 Reasonable Allocation

#### 3.1 Form High Standard Teaching Resources

Aiming at the construction of more than two kinds of media teaching resources, according to the actual situation, according to the principles of self-construction, purchase and communication, on the basis of developing some resources independently, the school buys some high-level courseware and introduces some high-quality courseware to establish and enrich multimedia resources suitable for students' online learning. The basic framework of English teaching mode in open education is shown in Fig. 3.



**Fig. 3.** Basic framework of the English teaching mode of distance and open education

The school adheres to the guiding ideology of “seeking first and then refinement”, first makes self starting resource courseware, and then solves the problem of insufficient high-quality resources on the basis of solving the problem of whether there are resources [13]. The school focuses on professional responsibility teachers and curriculum responsibility teachers, and is responsible for the design, integration, production, release and update of curriculum teaching resources. While sharing the teaching resources of Central Radio and TV University and Inner Mongolia Radio and TV University, the school timely publishes text resources such as curriculum description, teacher introduction, syllabus or teaching requirements, teaching implementation rules, assessment description, teaching key and difficult points, case discussion, homework exercises and so on. Carry out online interactive teaching activities through course forums and online teaching activities. Students can easily get the learning information of each course in the distance teaching platform, and can demand the streaming media video courseware of the course at any time, which provides all-round and multi-level teaching support services for students’ individualized independent learning. The construction and application of Distance English education teaching model not only improves the teaching quality of Distance English education, but also improves the level of teachers engaged in Distance English education teaching activities. The comprehensive quality that TVU Teachers who undertake the teaching task of Distance English education should have must not only have noble moral quality and noble spiritual realm, but also have the concept of modern education, master educational science, understand the laws of Distance English education, have high professional quality and humanistic quality, but also have strong modern educational information technology ability. Through the operation of the teaching mode of Distance English education, the majority of teachers’ information awareness ability, teaching design ability, resource selection ability, effective access to information, resource ability, evaluation of information resources ability, use of information resources ability and development of information resources have been generally improved. The

operation of the new teaching mode of Distance English education has become a powerful driving force for the great leap forward development of the school, and the scale of the school has gradually expanded, The continuous improvement of education quality and the significant enhancement of comprehensive strength are mainly reflected in the first, which effectively solves the problem of lack of Applied Talents in human resources. Due to the flexible school running form of Distance English education, the sharing of national high-quality resources and the advanced holding of majors, the first division can form a certain productivity and promote the adjustment of industrial structure and economic development. After the rise of industry, the holding of majors can also provide application-oriented talents for the adjustment of industrial structure.

### 3.2 Database Optimization Query Method Based on Diverse Constraint Models

Using traditional algorithms to optimize query of distance education database cannot avoid the defect of large differences in data attributes caused by excessive data volume, resulting in lower database query efficiency. Therefore, a database optimization query method based on multiple constraints model is proposed.

In the process of establishing the multi-constraint model, the diversity of the same data attributes is fully considered, therefore, unnecessary cumbersome data features can be reduced. The steps are as follows: Using the following formula, the similarity coefficient of the data in the database can be calculated:

$$\sin(w_b, w_c) = \frac{\sum_{l=1}^n X_{bl} \times \sum_{l=1}^n X_{cl}}{\sqrt{\sum_{l=1}^n X_{bl}^2 \times \sum_{l=1}^n X_{cl}^2}} \quad (1)$$

Through the method described above, we can distinguish the similarity of cumbersome and repeated data in the database, and then use the feature vector to describe the relevant data with strong similarity in the database.

The following formula can be used to calculate the variation parameters of different data attribute characteristics:

$$e(y, z) = \left[ \sum_{j=1}^p |y_j - z_j|^s \right]^{1/s} \quad (2)$$

Assuming that the value of  $s$  changes, the difference of data attribute characteristics is strong.

Assuming  $s = 1$ , the characteristic value of data attribute obtained by the above formula is negative, so it is necessary to use the following formula for calculation:

$$e(y, z) = \sum_{j=1}^p |y_j - z_j| \quad (3)$$

$y$  and  $z$  represent the characteristics of different data in the database, and the distance between them can represent the similarity of the two:

$$e(y, z) = \left( (y - z)^T B (y - z) \right)^{1/2} \quad (4)$$

where  $B$  is the non-negative definite matrix of the data in the database.

According to the method described above, the data in the database can be classified and processed, and the information in the database can be divided into multiple different categories according to the data characteristics, so as to provide an accurate data basis for database optimization query. Establish a variety of constraint model, judge the data categories that meet the query conditions, and query the data according to different data categories, so as to realize the optimal query of the database. Through the above experiments, we can know that using this algorithm to query the database can effectively improve the efficiency of database query.

## 4 Conclusions

Under the environment of open distance education, English teaching in RTVU is an important part of RTVU teaching system, and the construction of English teaching resources in RTVU is an important guarantee to improve teaching quality. This paper presents an optimized query method of distance English education database based on multiple constraint models. Classify the data in the database, divide the information in the database into several different categories according to the data characteristics, and provide accurate data basis for database optimization query. Establish diverse constraint models, judge the data categories that meet the query conditions, and query data according to different data categories, so as to realize database optimization query. The experimental results show that using this algorithm to optimize database query can effectively improve the efficiency of information query in distance English education database.

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