

# Teacher Education Technology Training Support System Based on Blended Learning

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**Abstract:** In order to support the management of college teachers, a teacher-education technology training system based on blended learning was proposed. Problems of educational technology training for university teachers were summarized and analyzed. Based on this, using blended learning related ideas, a model of college teacher education technology training support system based on blended learning was proposed. The results showed that the proposed model and training support system enriched and improved the blended learning idea. It had a positive effect on college teachers and educational technology training. Therefore, the system provides new ideas and new models for the organization of educational technology training for teachers in colleges and universities.

## 1. Introduction

At present, the main mode of teachers' education technology training in Chinese universities is the traditional class or online learning [1]. The training mode of the school is single. Even if the two models are combined, they cannot give full play to the advantages of the two and achieve complementary advantages. The effect of training is not ideal [2]. Therefore, it is of both theoretical and practical significance to design the support system of educational technology training for college teachers by using blended learning ideas.

The specific situation of educational technology training for university teachers was investigated. The main problems of college teachers, educational technology training, and related ideas of blended learning are studied. On this basis, a concrete mixed strategy for the college teacher education and technology training support system is proposed [3]. Then, based on the actual needs of training, a model of college teacher education technology training support system based on blended learning was proposed as a practical problem in solving the training process. The long-term training support service program was constructed. The model focuses on the concept of "learning activities". The training support system is divided into two modules: "learning activity support" and "learning activity management". The overall support for the design, organization, execution and management of the educational technology training activities of university teachers is realized.

## 2. Literature Review

Blended learning is a learning idea originated from the bottleneck of development of e-learning. People's reflection on learning in pure technology environment is not a specific theory [4]. Since 2000, after the U.S. Department of Education put forward two opinions on E-Learning in the "White Paper on Educational Technology", the academic community has formed a unified understanding. The traditional classroom teaching mode and network learning are combined to achieve the optimization of teaching. It developed into a later blended learning idea [5]. The essential

requirement of blended learning is to rationally select and optimize all elements of teaching and learning so as to achieve maximum benefits at the lowest cost.

With regard to the specific application of blended learning in the training of teachers' educational technology, scholars at home and abroad have made a specific study from different aspects. Yang Qiong, a domestic scholar, has introduced the concept of informal learning to the training of educational technology. Du Fangfang and Yue Hongwei have constructed the model of education technology training for primary and secondary school teachers. Wu Lijuan and Huang Jingwen put forward a model of educational technology training in colleges and universities with the principle of informal learning. The contents and forms of informal learning in the process of educational technology training for university teachers were studied in depth [6].

### **3. Methodology**

#### **3.1 Mixed strategy of multiple teaching models**

In general, blended learning is a mixture of multiple learning patterns. According to the different classification standards, from the different aspects of the teaching practice, there will be different results for the division of the specific teaching mode. Therefore, scholars at home and abroad have different views on the model of blended learning. At present, the unified view is to explore blended learning from formal learning and informal perspective. From the perspective of classroom learning and network learning, the way of mixing is discussed. The following views on the combination of classroom learning and network learning are briefly analyzed.

#### **3.2 Mixed strategies for multiple learning resources**

There is a natural contradiction between the mixing of resources. On the one hand, the number of resources must be abundant; on the other hand, the retrieval speed of resources is faster and the number of resources cannot be too large. Therefore, in theory, the mixture of resources is how to achieve the balance of the two parties. At present, the price of large capacity storage equipment is reduced and the speed of reading disk is increasing. The resource retrieval time of the storage device is almost negligible. Therefore, the key to improve the retrieval speed is the problem of the resource storage strategy and the retrieval strategy. Through the rational description and classification of learning resources, the speed and accuracy of the system to retrieve a large number of learning resources is improved.

#### **3.3 Mixed strategies for multiple learning tools**

With the development of information technology, efficient learning is almost inseparable from the application of various tools, such as search engine to search knowledge, online calendar tools to achieve learning schedule management, blog to achieve personal knowledge management and so on. Teacher education technology training not only requires the trainees to master the use of a large number of tools, but also to guide students to learn to use all kinds of tools. Therefore, it is necessary to establish a systematic library of learning tools, that is, the effective mixing of learning tools.

### **4. Results and discussion**

#### **4.1 Overall design of support system**

A model of college teacher education technology training based on blended learning is proposed. The model divides the training support system into "learning activity support level" and "learning activity management level" as a whole. The block diagram of the model is shown in Figure 1. In the Figure 1, the lower part is the "learning activity support layer", which mainly supports the implementation of various modes of learning activities. The upper part is the "management of learning activities", which mainly implements the functions of learning activity design, learning activity matching and learning activity process management.

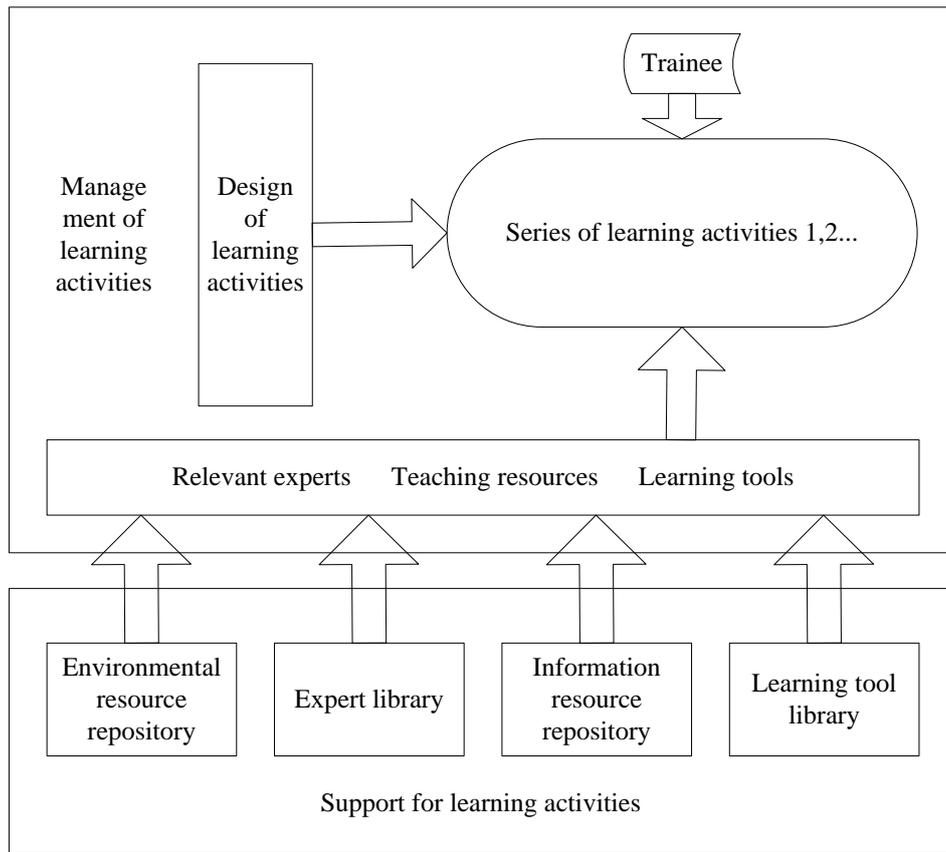


Figure 1. Model of teacher education technology training support system based on blended learning

The main purpose of training learning support system design is to provide teaching resources, instructional design and learning process management platform support for university teachers' education technology training. On the function design, the platform can provide a powerful platform for educational technology training. The operation interface should be simple and easy to use. With the above support system model as a guide, the system function modules are further refined to form a detailed system function module, as shown in Figure 2.

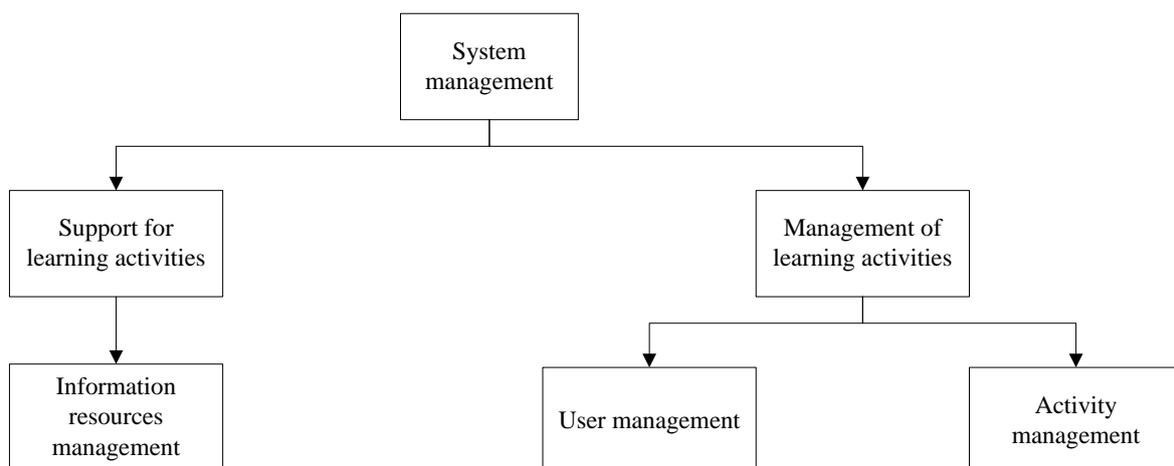


Figure 2. System function module design

#### 4.2 The creation of knowledge objects

The creation of a knowledge object needs the copyright information, the label information, and the description information and so on. The specific process is shown in Figure 3. The specific methods of creating knowledge objects include two methods: "local file upload" and "external resource addition". The "local file upload" means that the knowledge object description information

and the knowledge file are added to the system's corresponding library (the learning tool library or the learning resource library). The "external resource adding" approach refers to a way to index external resources, which mainly submits the detailed description information and link information of the knowledge object.

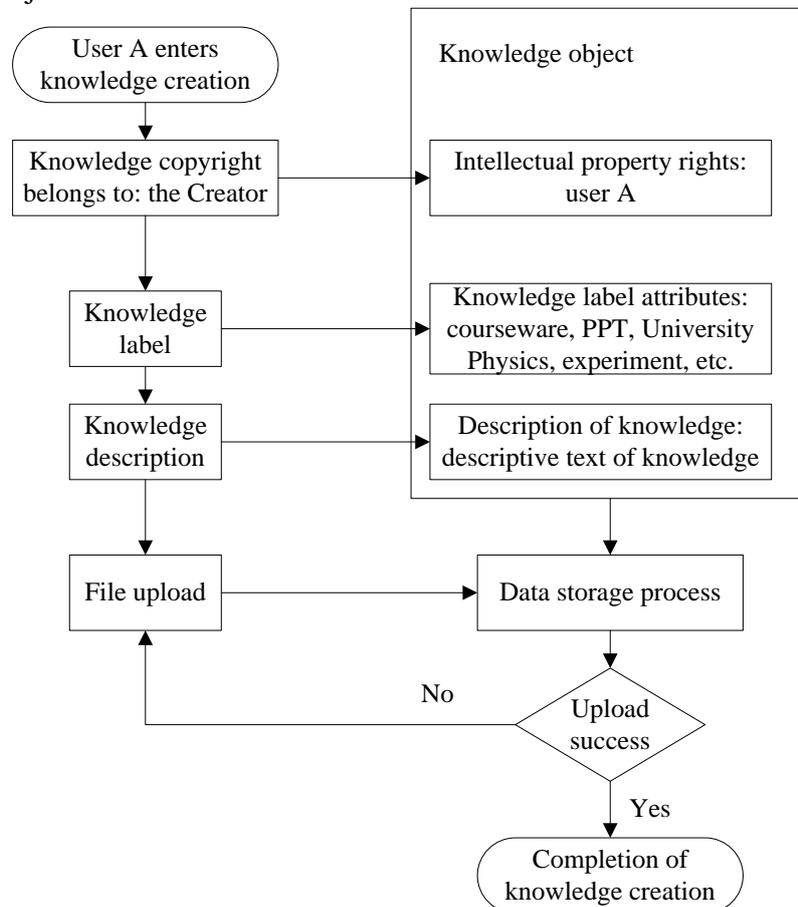


Figure 3. Knowledge object creation process

### 4.3 Matching and selection of learning activities

With the continuous use of the system, the learning activities in the system are increasing. The trainee needs to select the appropriate learning activities to enter the study according to the individual's learning needs. Therefore, how to select a truly suitable learning content level and personal learning style in a large number of learning activities is a problem worth discussing. This system applies the relevant knowledge, and puts forward the following solutions:

First of all, the system takes "age, professional title and discipline" as the parameter. The information of the newly joined learners and the existing learners of the system is compared. The three-parameter perfectly matched learner is searched. Then, all "learning activities" of the matcher are searched. The learning activities that have been searched for successively include learning activities 1, 2, 3, 4, and 5. In this way, it is possible to establish a plurality of paths from newly added learner A to matched learners 1, 2, 3 to learning activities 1, 2, 3, 4, and 5, as shown in Figure 4.

The system traverses each path in turn and calculates the number of paths from learner A to each learning activity. It can be concluded that the number of passages from learner A to learning activities 1, 2, 3, 4, and 5 is 1, 2, 3, 1, and 10 respectively. This value serves as the strength of the association between learner A and these learning activities.

Then, according to the value of the association strength of the learning activity, the ranking is from strong to weak (the same as the first row of learning activities that are searched first). The result of the learning activity in Figure 4 is learning activity 3, learning activity 2, learning activity 1, learning activities 4, learning activities 5), and presented to new learners A. Learner A determines

the learning activities that he/she needs to participate by looking at the details of the learning activities and applies for admission.

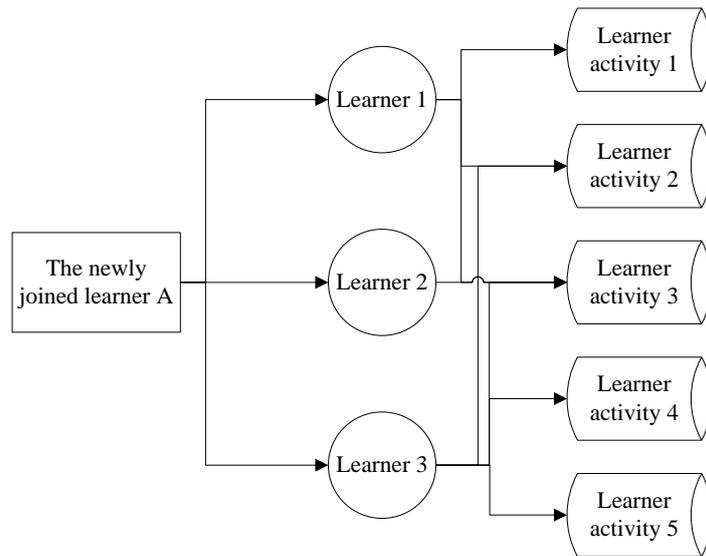


Figure 4. Automatic matching principle of learning activities

#### 4.4 Implementation of learning activities

The implementation of learning activities includes the overall process of learning activities (external processes) and the internal process of learning activities. The general process describes a general goal of learning, which includes a series of learning activities, and the successively related relationships between activities. The internal processes of the learning activities design the pre- and post-inheritance and jump relationships of the internal learning pace of learning activities.

The implementation of learning activities refers to a series of learning activities based on certain learning goals or learning topics. Each trainee can choose to participate in one or more learning activities. Each learning activity is based on the learning pace of the learning activity to complete the learning of the knowledge content under the guidance of the teacher. The entire process of learning includes initial learning activity matching and learning tasks for a series of learning activity sequences. The overall process of implementing the learning activities is shown in Figure 5.

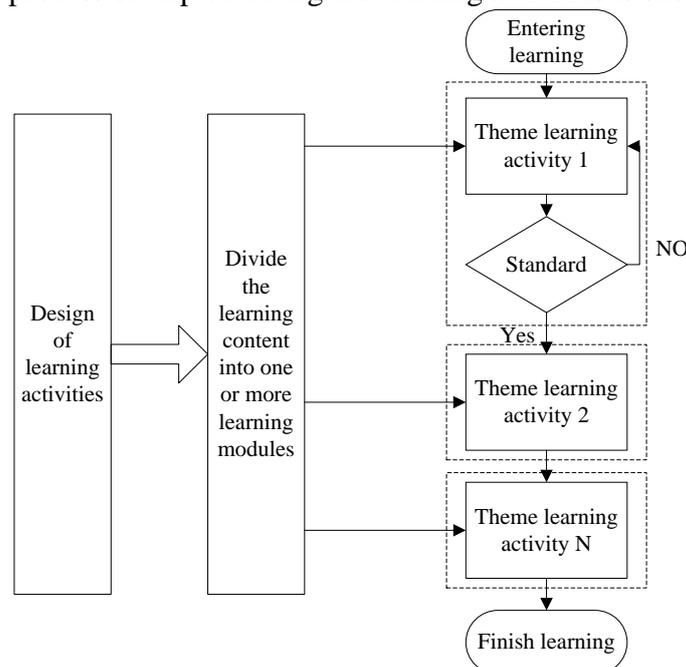


Figure 5. The overall process of learning activity execution

The learning activity design first initiates learning activities by submitting learning activity information (including learning activity topics, learning activity time, learning activity introduction, etc.), and then enters the learning activity customization page. Each learning activity is divided into multiple learning steps according to the steps of knowledge learning. The main task is to complete the design of the internal step of learning activities, as shown in Figure 6. The dotted line in the figure is a learning pace process. A learning activity process is to complete all the learning paces that have been added during the established and learning process.

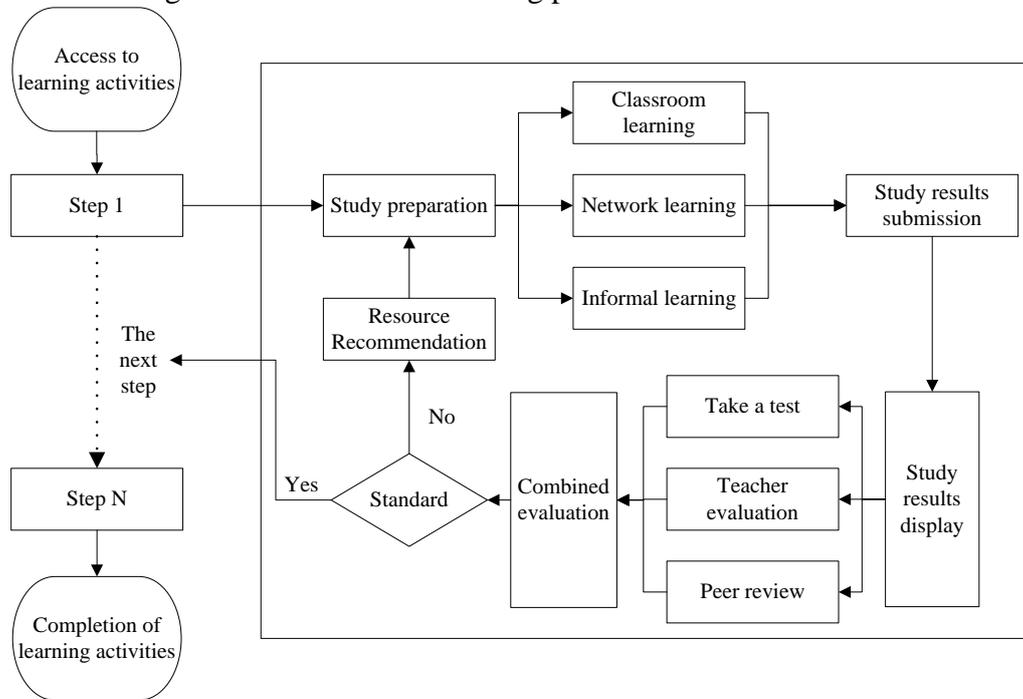


Figure 6. Internal process of learning activities

## 5. Conclusion

In view of the current problems in the training of college teachers' educational technology, a variety of hybrid strategies are proposed using the ideas of blended learning. Based on the research of college teachers and their educational technology training and related theories, a model and detailed functional structure of a college teacher education technology training support system based on blended learning are designed. The design of this model is based on the idea of "blended learning" and comprehensively uses the concepts of "cognitive elastic learning theory" and "dual-master teaching model". The model of the support system of educational technology training for teachers in colleges and universities is put forward. It has realized the functions of designing, organizing and managing the educational technology training activities of university teachers. The system model is concentrated on the concept of "learning activity" and provides support for practical learning activities. A series of tasks such as activity design, activity execution, and activity adjustment are completed.

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