

# Research on the Computer Skills Training System in Higher Vocational Education Based on the Cloud Computing

Fang Li\*

*Chongqing City Management College, Chongqing 401331, China*

## Abstract

Given the vocational school training program management problems in the process, this paper discusses the design of higher vocational colleges training program management system. The article first analyzes the vocational college training program on the problems, and then the question of the functional requirements analysis training program management systems, business processes and user roles; according to the functional requirements of the system, designed the training program system architecture, network architecture model, analysis of the database model of the system, Finally training program management system are summarized.

Keywords: COMPUTER SKILLS, TRAINING SYSTEM, HIGHER VOCATIONAL EDUCATION, CLOUD COMPUTING.

## 1. Introduction

With society development and information technology evolution, computer curriculum, which begins to set up at 1980s in our country, gradually evolves into information technology curriculum aiming at fostering informational accomplishment after different growing phases. Following the publication of "information technology curriculum standard in senior high school"(being amended) in 2013, information technology curriculum expands to the whole country step by step, which makes the paper significant. However, the implementation of information technology curriculum tends to technique-orientation in subject, content, process and evaluation, in which way, leading to "start-point vacancy" and "course shield"; furthermore, it causes to phenomenon and problem of "culture inherited" and "culture unification". Under such guidance, the paper focuses on "problems existing in implementation of information technology curriculum", whose reason traces back to technique-orientation through research and survey from analysis of 6 teachers' 72 lessons in 3 provinces in our country [1-2].

According to solving the problem, cultural orientations of curriculum implementation in information technology curriculum tops the list, from the view of subject quality, subject history, educational reform tendency, curriculum reform basement and internet culture. Then, the structure of cultural orientations of curriculum implementation in information technology curriculum includes the following elopements: people [3], content, process, evaluation and field, which provide a fresh eye on students' learning-absent.

Technology-oriented Information Technology (IT) course has encountered various problems in both theory research and practical operation, thus its research needs to be performed in the aspect of culture. However, the previous researches put most emphasis on the orientation of course implement itself and technology of IT course. They seldom start with the research in the elements of course implement to investigate the culture oriented connotation.

«Phenomenon and reason of technique-orientation in curriculum implementation" studies the phenom-

enon in real class observation, including people, content, process, evaluation and field; however, subject development history, its imperceptible quality and setbacks of setting of regional curriculum all contributes to the reason.

The leading social culture transformed into multi-variation from the ethical culture and rational culture via science and technology rational culture, which made people in different countries, analyze the education issues on education innovation or course innovation from the cultural angle. Exaltation of information attainment is highlighted. Therefore, it can put forward the course cultural research gradually from the research model of organ on to ontology. Under such macroscopically circumstances, IT course aims at the promotion of information attainment. However, the rich culture connotation of information attainment itself together with the cultural implement in the principal bodies, content, process and assessment, call for a research in the culture field [4-5].

Meanwhile, IT course is a course formed on the basis of advanced development of IT and it is a kind of culture in itself. The two supporting bodies--material facilities and relevant sets of resources--have a rich cultural connotation. All of these lead to the inevitability of the culture orientation of IT course implement [6].

"implementation subject" shows that students should be the culture taker with colony meaning and individual cultural significance, rather than teacher; meanwhile, as for its specialty, teacher, president, parents, community members and curriculum expert all can be regarded as a member of culture power communion, which may participant in class in a "absent but existing" mode.

"Implementation content" criticizes culture conflicts in social requirement and curriculum pioneering, selection and presentation and student's "zero" start point, which demands the selection of content to be consolidating [7], situational and developing, which bases on curriculum standard and textbook, which leads to a reasonable, scientific and practical system.

"Implementation process" is a co-operation process of real culture and informational culture, which is also an individual process of main-side and elegant-grassroots culture. In the case of carrier, individualization of informational culture is a transform among pre-text, text and being text and it is also a process of culture experience, structure and absorbing.

"Implementation evaluation" -indicates objective's developing, co-operational and authentic orientation in the process of negotiating and reflecting. The pa-

per analyzes the experience of rubric of information and communication technology in Britain [8], which makes up a negotiation-conversation-reflection evaluation standard system in the aspect of PTA (Primary Trait Analysis) and SOLO (structure of the observed learning outcome arrangement). "Supporting field" requires the participation of Internet culture resource, especially teacher-student culture with Blog and Wiki carrier, which needs to build virtual community and exploiting traditional and physical means of time and space.

### **2. The Main Framework and Theory Foundation**

Since Mr. Charles Vest, President of MIT, declared official launch of MIT Open Course Ware (OCW) in April 2001 in Time magazine, many world-renowned universities have joined the program in succession and OCW has flared up. In recent years, OCW has unfolded a new momentum. The rise of Massive Open Online Course (MOOC) has enabled OCW to overcome the shortcomings of its traditional mode.

Interactions and communications have become important elements DOCW. Meanwhile, as the cloud computing technology matures, its features including flexibility, scalability, sharing, low cost and serviceability have rendered new technical supports for the application of OCW.

However, there are still some problems in OCW, such as inadequate interactions between teachers and students, lack of collaboration among learners, deficiency of learning effect tracking methods and lack of flexibility of traditional platform, which affect the in-depth application of OCW and cause the idleness and waste of many high-quality educational resources.

Vocational training program is a vocational college "legal" documents, is to carry out teaching guide to action. In order to better enable professional development adapted to regional economic development, vocational colleges should organize professional annual professional training program be revised. Personnel training program revision is a time-consuming effort to spend more of a project; the reason is mainly the following aspects:

1) Training Program in the Department, and the Office of Academic Affairs Department of the Ministry repeatedly circulation, auditing, version control on cause difficulties. A professional training program may have to modify the draft more, pay more than the audit, if tracking is not in place, it is likely to cause which version is the latest version of the question.

2) Traditional hand-made training program before and after the data prone to inconsistency. Because of the professional training program document length,

related to the course a few more doors, describe some courses, class assignment and assessment methods and so will come out in more than one place, it will be very likely to cause data inconsistencies before. 3) Traditional hand-made training program data calculation error prone. In the professional training program in the course of weeks and the number of class hours per week can calculate the total hours of a course, but often there will be a lot of curriculum theory and practice lessons to be involved in the calculation, under the manual operation mode, a large number of courses total hours, total hours semester hours in total and professional computing easy to produce errors, and these errors are not easy to find.

4) Query training program is not convenient, because the finished training program based mainly in paper documents, paper manuscript limited number of teachers and students is very difficult to have a copy, so the query data in the training program will be very difficult.

5) Since the training program is a review long documents, very difficult way traditional manual typesetting.

6) The training program is not well with the Department of the Ministry issued a teaching task and teachers to prepare lesson plans or schedules were very good convergence. Departments in the production of each semester teaching assignments table, takes a lot of time and effort to proofread important data class, school weeks, test methods, teaching management system to the Department brought a lot of trouble. Also at the beginning of each semester to be prepared teachers teaching schedule, but also detailed data class, the examinations for the course taught by check, access is also very convenient.

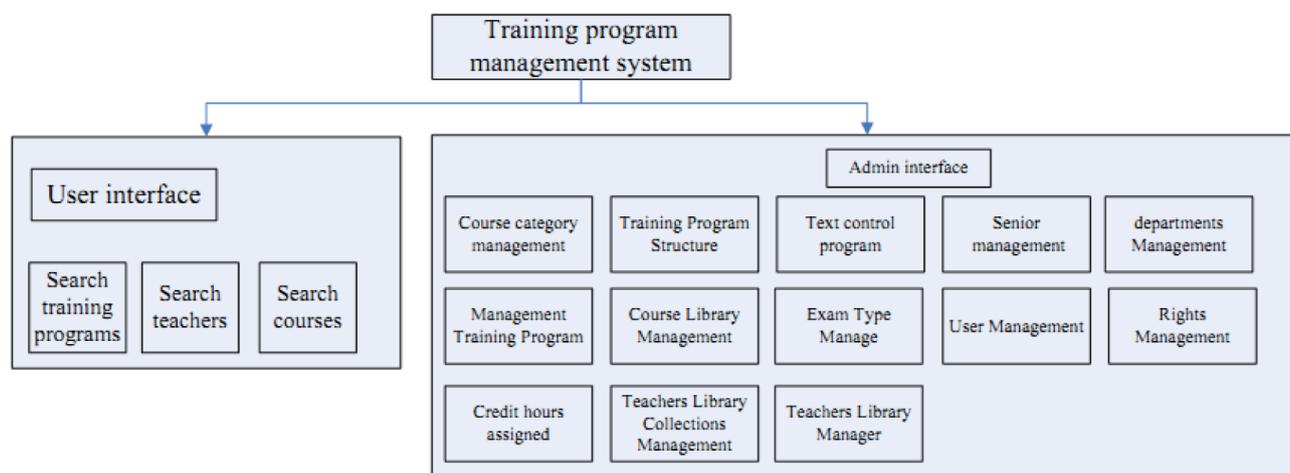
In summary, if the professional training program of college information management, to improve per-

sonnel training program was revised in the future related to the efficiency of access and use, the Department of the Ministry of teaching management and students will bring it Great benefits.

### 3. The Needs Analysis

Training program management system is mainly to achieve paperless management training program of the entire process, including the creation of personnel training programs, and other audits, teachers and curriculum library database creation and audit personnel training programs. The system provides service to students and faculty through the B/S mode, the training program for the internal data Institute data, not open to the public, and only legitimate users can access status. According to the above features, functions training program management system shown in Figure 1.

In the training program functions, program libraries, professional name, grade and type of course is the basis of the data system, all the training program should focus on some basic data to generate two additional personnel training programs as well as part of the text, such as Training Target, professional orientation and so on for the text, the text needs to be managed separately. Ordinary users can only operate foreground program inquiries, curriculum and teacher database query database query. Director of the Department can operate Course category, curriculum library, library teacher, course type, text control personnel training programs and personnel training programs generate. Training Program Director of the Office of Academic Affairs Department of the Ministry can be submitted to the director of the Department, the curriculum library, library and other teachers review the data. System administrators can the department of information, user information, authority information and other basic data maintenance.



**Figure 1.** Training program functional requirements

Training Program Management System first adding user information, permissions information, department information and other basic data by the system administrator, according to Dean's request, customized training program structure to Zhejiang Oriental Vocational and Technical College, talent Training program includes training objectives, training levels, personnel positioning, fourteen part of teaching process table, practical courses, graduation requirements, etc. Then director of the Department is issued by the professional training program according to the structure of the composition, complete professional name, grade, specialty curriculum, curriculum classification, text and other personnel training programs. Department Director design good year training program to be submitted to the Department after level for review, approval and then submitted to the Office of Academic Affairs audit, after completion of the audit of Academic Affairs, Health and version information personnel training programs.

If you need to modify director of the Department, the Department of the Ministry and the Office of Academic Affairs would like to submit to amend the application, two management department consent amend, revise the process to submit and resubmit modify records, and generate second version information. System operating mode is shown in Figure 2.

#### 4. The Algorithm

With the booming development of academic research cooperation, co-author networks gradually become the hot point which scholars focus on. Co-author network refers to complex network of relationship between the co-author, and it's one of the social networks. Co-author network plays an important role in Entity Organization. Researchers often measure authors' influence through analysing co-author network, and make a corresponding decision to improve personal influence.

Leaderrank algorithm is a new effectively ranks web pages based on the hyperlink network, which was devised by Linyuan Lü, et al in 2011. The algorithm is a new algorithm improved based on PageRank. Its core idea is: introducing a ground node connects to every node through bidirectional links, thus the network becomes strongly connected. Through calculating the influence ranking, it's easy to find that: the authors never co-author with anyone except Paul Erdős, which has small influence in co-author network. How to choose the best co-operator is the key to promote their influence.

Key algorithm can be described as equation 1:

$$(N, sk) \leftarrow Key(1^k) \quad (1)$$

This formula is used to generate file checksum parameter. Generate parameters N, e, d meet the conditions of RSA assumption;

$$r \leftarrow \{0,1\}^k; sk \leftarrow \{e, d, r\}; Output\{N, sk\}; \quad (2)$$

Algorithm executed by the C, time complexity is O(1), generating a hypothesis based on RSA security parameters N, e, d: first select the two big security primes P and q, calculate the RSA modulus  $N = p * q$ , Euler function is:

$$\phi(N) = (p-1)(q-1) \quad (3)$$

Then choose an integer e to satisfy the following equation 4:

$$\begin{cases} 1 < e < \phi(N) \\ \gcd(e, \phi(N)) = 1 \end{cases} \quad (4)$$

Making sure that  $d = e^{-1} \bmod \phi(N)$  Generating a k-bit random number r, and let e, d and r as the secret key; then finally export (N, sk).

Tag algorithm:

$$(T_0, T_2, \dots, T_{n-1}) \leftarrow Tag(pk, sk, m) \quad (5)$$

The formula generates labels for each file block.

$$for(j = 0; j \leq n-1; j++); \quad (6)$$

$$\{W_j = r * (j+1); T_i = [h(W_j) * m_j]^c \bmod N\}; \quad (7)$$

$$Output(T_0, T_2, \dots, T_{n-1}); \quad (8)$$

#### 5. The Implementation and System Design

In order to facilitate the external provided no time and no space constraints services, structure of the system to be adopted B / S mode, the server can be set up on the campus network, without providing additional expenses, because it is multi-user service, the platform should have level scalability, increase the number of users in the case, you can just add hardware to solve, without the need for reconstruction of the platform. In addition the system in addition to providing services for the campus network users, but also for external users over the Internet to remote access, network structure of the system shown in Figure 3.

Training Program system uses multi-layer architecture implementation, as shown in Figure 4, the following is a description of the different levels of functionality. Platform interface: the user interface operation, depending on the user permissions feature presents different interfaces for users with different permissions operational functions to provide differentiated interface, such as a different user interface and Department Director, Director of the Department of the user interface, these different mainly related to personalized display system menu and page elements.

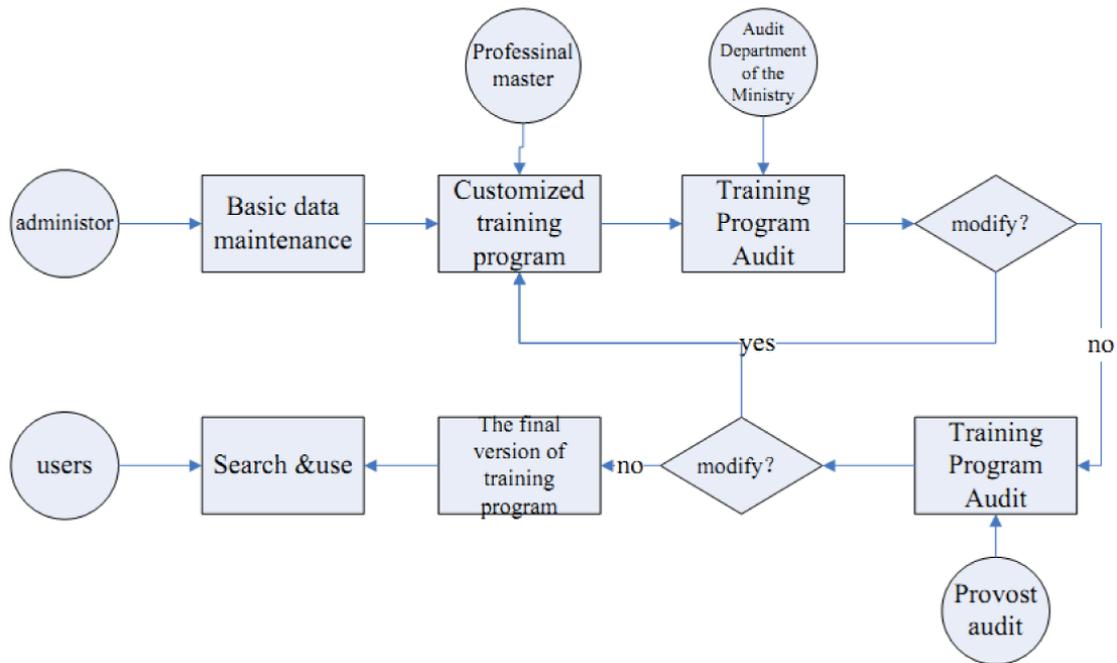


Figure 2. Training program running mode

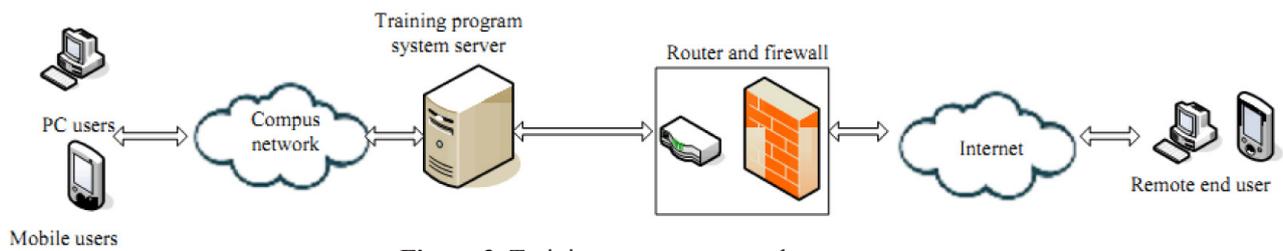


Figure 3. Training program network structure

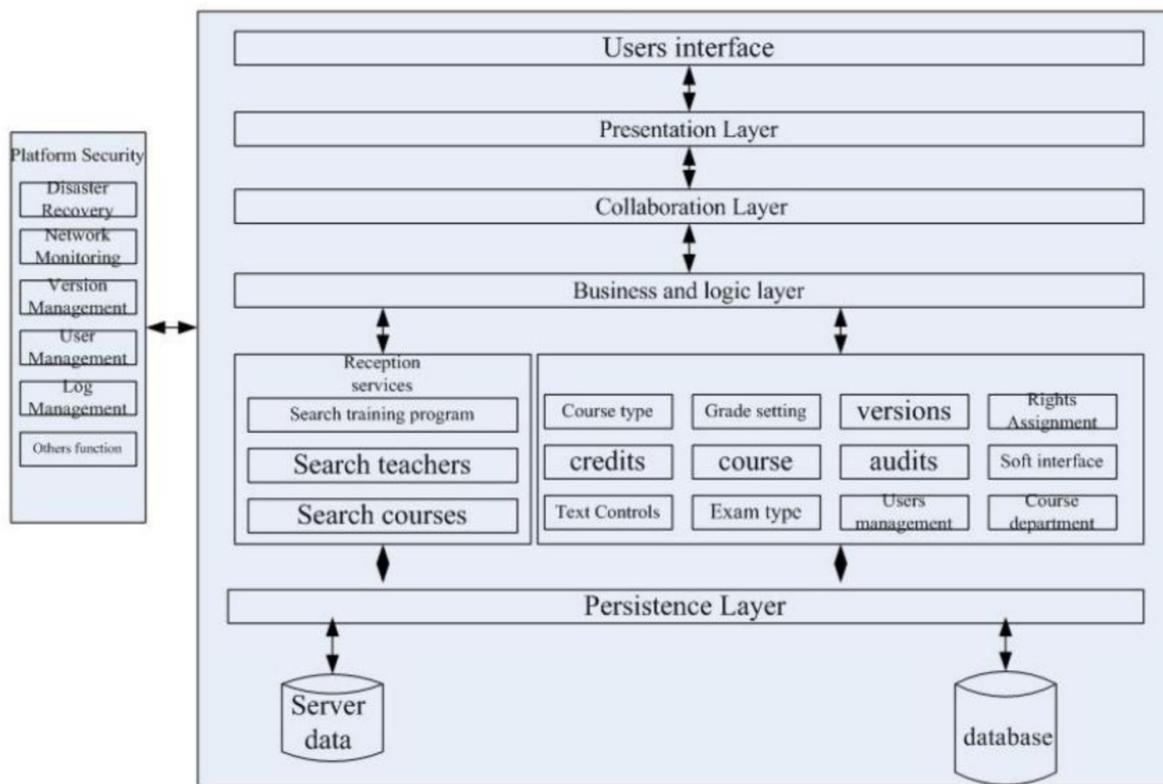


Figure 4. Training program system architecture

Presentation Layer: receiving user input data, and the data processing results presented to the user. Collaboration Layer: mainly used to implement customized to provide users with custom features and system configurations to meet user-specific needs. Platform through this layer is set to coordinate the exchange between the presentation layer and business logic layer. Business and logic layer: business logic platform judgments.

The main function of the platform: Business Services. Database layer: to save the user a variety of data: business data warehouse data, metadata, and various data files.

Platform security: mainly used to ensure the safety and smooth operation of the platform, including disaster recovery, network monitoring, version management, user management, system logs, etc., in which the system log detail recording all user actions in the system, for the latter part of the site audit provide data support.

Management Training Program involves multiple departments, business process is relatively complex, and it is more difficult in the database layer modeling relatively general management information systems.

In the business layer and database persistence layer for an intermediate layer to be mirrored by the original data table view, to provide fast data support services for the business layer.

System on the basis of data classification table includes curriculum, curriculum library, library personnel training program structure, personnel training programs Text Library, personnel training programs in the process table, library teacher, department information library, library privileges, grade library, specialized libraries, and so on. After the training program curriculum library in turn, professional library, grade library, personnel training programs in the process table, personnel training programs Text Library few tables combine to produce, in order to provide fast service to the business layer, according to the structure of the training program, from above the library to extract some form field training program view to achieve.

Database design of the system shown in Figure 5. Given the vocational school training program management problems in the process, this paper discusses the design of higher vocational colleges training program management system. The article first analyzes

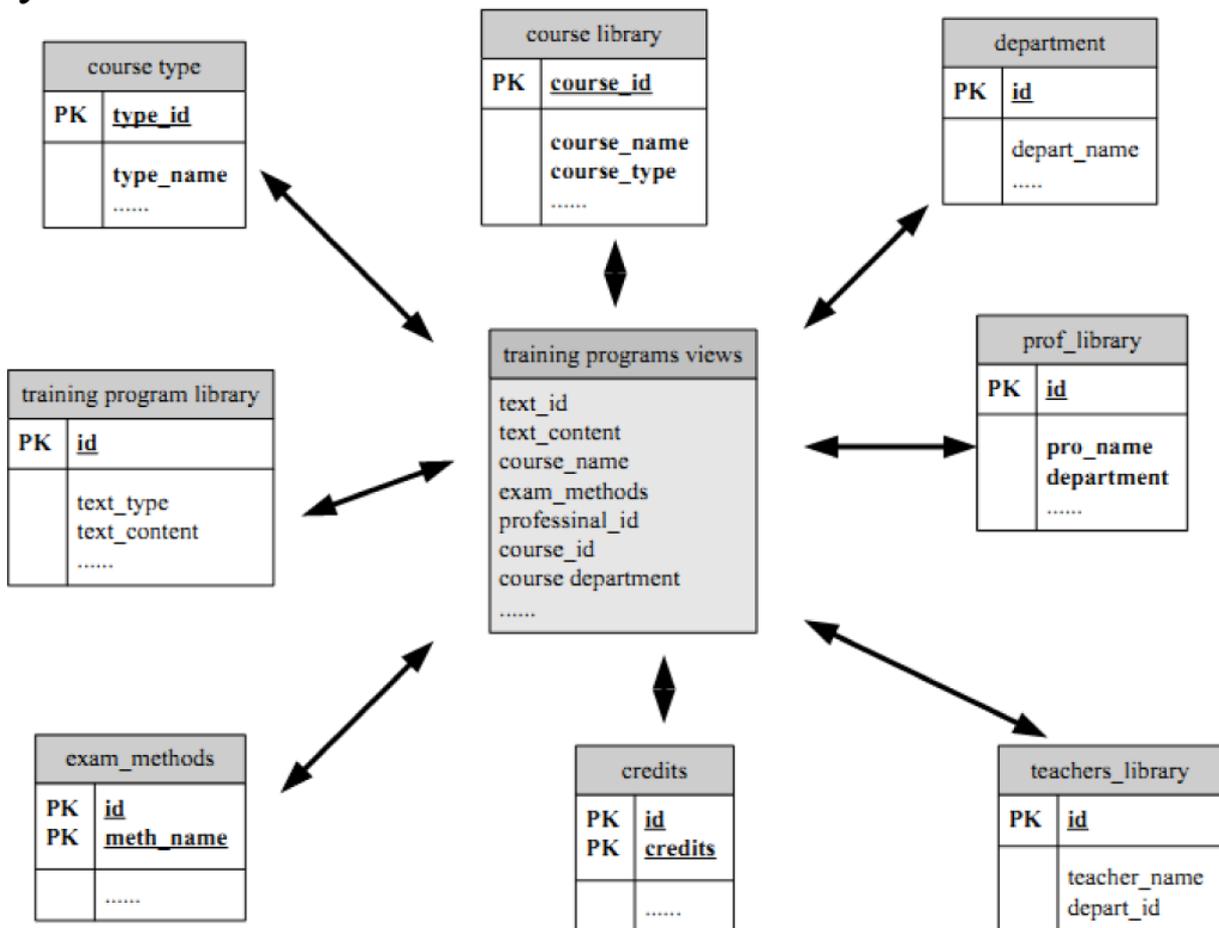


Figure 5. Database design training program system

the vocational college training program on the problems, and then the question of the functional requirements analysis training program management systems, business processes and user roles; according to the functional requirements of the system, designed the training program system architecture, network architecture model, analysis of the database model of the system. Finally training program management system is summarized.

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## Design of Education Cost Assessment Information System based on DEA Cost Minimization and DEA Efficiency

Yuanzhen He\*

*Aba Teachers University, Sichuan, Wenchuan, 623002, China*

### Abstract

With the continuous expansion of domestic colleges and universities and the rising tuition, the problems of college education cost control appear. The all-cost assessment flow of the research university education cost is analyzed, the method that combines the minimization model of DEA cost with DEA super-efficiency model is adopted. And the efficiency evaluation system of research university education cost is constructed, which provides the cost