Computer-Aided Design AND APPLICATIONS

Digital Innovative Talent Training Practices in University Libraries Within the Double First-Class Framework

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Abstract. In order to improve the innovative practices in university library discipline talent training under the background of double first-class, this paper studies the innovation time of university library talent training in combination with the needs of modern universities for library discipline talents. In order to improve the processing effect of university library discipline talent training data, this paper uses the semi-parametric product method to estimate the regression model, and combines the advantages of parametric regression and non-parametric regression to use the semi-parametric product adjustment method to fit the hyper-population regression model. In addition, this paper uses non-parametric adjustment terms to perform regression estimation on the model based on the linear function, which further improves the accuracy of sampling estimation compared with the traditional generalized regression estimation. Finally, according to the research conducted by the expert evaluation methods, the method proposed in this paper has a very obvious effect on promoting the innovation of subject personnel training in university libraries.

Keywords: double firstclass; university library; discipline talents; new practices;
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1 INTRODUCTION

People are the most active and active factor among the factors of productivity. Moreover, the masses are the creators of history, and only by fully mobilizing and exerting human subjective initiative can the sustainable development and progress of human society be realized. In the era of knowledge economy, scholars and managers generally believe that human resources are the most important and special among all resources.In particular, after the human society has entered the era of knowledge economy, the importance of human resources is more prominent, because the core of knowledge economy is science and technology, and the key lies in talents.

After the human society has entered the era of knowledge economy, knowledge is not only a kind of wealth, but more importantly, it can also create wealth. The strong demand for information and knowledge in the economy and society has promoted the consumption of knowledge, the groups that learn knowledge are constantly expanding, and people's learning motivation and desire are increasingly strengthened. Therefore, the status of university libraries, which disseminate knowledge, serve teaching and research, and provide strong support for knowledge and technological innovation, will become higher and higher, and its role will also be greater.

In the era of knowledge economy, the production, dissemination and application of knowledge must be realized by people, the strategic position of human resources has been established, talents have become the first resource and play a key role, and the success or failure of a career will depend on the number of high-quality talents. As far as university libraries are concerned, the status and role of librarians are more prominent in the era of knowledge economy, and having a high-quality team of librarians has become the fundamental guarantee for the scientific development of library undertakings. Therefore, the quality requirements for librarians are also raised accordingly. The author believes that the quality of librarians in the new era should be mainly reflected in the aspects of information processing ability, basic skills, professional level, sense of responsibility and creative ability. Comprehensive analytical skills. If librarians want to develop, utilize and manage literature and information resources well, and turn knowledge into productivity, they must not only have professional knowledge of library and information, but also be proficient in using computer technology, as well as know one or two foreign languages. Librarians should strive to become innovative, comprehensive, multi-skilled and high-quality talents through continuous learning and updating of knowledge. Innovative practices for training individuals within the university library system to better manage and provide access to digital method.

Based on the needs of modern universities for library discipline talents, this paper conducts a research on the innovation practice of university library personnel training, and analyzes the innovation strategy of university library personnel training through intelligent methods.

2 RELATED WORK

The literature [7] pointed out that the matching of personnel and job is the adaptation or incompatibility between the responsibility of the individual to the job, the individual ability, the workload and the difficulty of the work, and this matching relationship will have an impact on the performance of the organization. The degree of human-job matching is reflected in the degree of adaptation between individuals and job characteristics. Literature [16], on the basis of previous research, pointed out that the theory of human-job matching can start from the perspective of demand and supply, and should pay more attention to the matching degree between personal qualities and jobs, and pay more attention to the working ability of individuals on the job, that is, Personnel-job matching comes from the suitability between individual needs and job requirements. Literature [17] pointed out that in addition to the matching of needs and supply, the matching of personnel and job should also include the matching content of demand and ability. Execution has a certain impact. Reference [1] proposes that the "open invocation model" reduces the ability of crowdsourcing platforms to expand or retain crowdsourcing-oriented employees. At the same time, the scholar uses collaborative filtering technology to propose a method through recommendation technology and push-pull model. Alternative models for the system to solve this problem. Reference [4] points out that the Julian Jarrett push-pull model is flawed in the way that vacancies are matched with job applicants, leading to unreasonable job matching, and discusses the extraction and presentation of job vacancies based on required and expected criteria in order to compare these criteria with Job seekers are matched. Reference [5] discusses job vacancy extraction and representation based on needs and expectations criteria, which also shows how simple keywordbased vacancies and job seekers matching (regardless of both criteria) can lead to incorrect matches .

Literature [11] found that the personnel problems that occurred when libraries migrated from a middle school environment to a community college environment, so as to understand the impact of environmental changes on employment, and also studied the effect of changing job roles and management models on librarians. influence. Literature [9] believes that with the development of information and communication technology, university librarians must learn to accept and use information technology in order to play their role in school education and scientific research. The results of literature [15] show that employees' job satisfaction is determined by the impact of organizational change, and organizational change is often a prerequisite for affecting job satisfaction. Reference [13] takes core competencies as the starting point in the research, and builds a human resource system to clarify goals and realize organizational value; secondly, it uses a more effective method in middle management, uses core competencies to set goals, and believes that core competencies can both Guiding the work of librarians and also providing training to new staff. Literature [3] pointed out that the human resources management of university libraries should pay more attention to the rigorous working attitude, scientific working methods, and good communication and coordination ability with staff. From the perspective of research content, the research on human resource management in the library industry is concentrated in many aspects, such as environmental change, staff training, performance appraisal and evaluation, incentive mechanism, and job satisfaction.

Reference [6] pointed out that the traditional career planning guidance based on "person-job matching" cannot play its guiding role well due to limitations in the practice process, while "chaos theory" can make up for the "person-job matching". Defect is a new type of thinking and conceptual mode of individual career planning, which pays more attention to the initial value sensitivity, nonlinearity and instability in complex systems. Literature [8] pointed out that employees' perceived personal-organization fit and personal-job fit have a significant positive correlation with their emotional commitment and job performance, while personal-team fit does not have a significant impact on emotional commitment. Reference [10] uses the theory of person-post matching, Parsons' trait factor theory and energy level correspondence principle to construct a nine-element model of person-post matching. Literature [2] comprehensively analyzes various discussions on the development of counselors' professional ability, and studies the key factors affecting the improvement of college counselors' professional ability from the perspective of person-job matching, that is, the characteristics of the counselor's occupation, the individual factors of the counselor, the institutional influences. Reference [12] pointed out that the public recruitment of public institutions is the main tool for public institutions to recruit talents. This is an important part of open recruitment, through which the basic qualities of recruiters can be understood. However, in practice, many processes lack compatibility and cannot reasonably meet the requirements of high matching of people and positions. The literature [14] pointed out that human-job matching is an important content to measure the efficiency of the labor market. Both strong and weak ties have the advantage of transmitting information resources; the formal information transmitted by weak ties can improve job seekers' external job-job matching, while the informal information transmitted by strong ties can help improve internal job-seekers. However, the human influence of strong ties will also reduce external job matching. Weak ties transmit external information, while strong ties reduce information asymmetry in the labor market by transmitting internal informal information, and play a positive role in increasing the efficiency of labor resource allocation.

3 MODEL-ASSISTED SAMPLING ESTIMATION METHODS

According to the correlation between research variables and auxiliary variables, different super-population regression models can be constructed, and different estimation methods can be used to fit them, and then their corresponding estimators can be constructed. This paper mainly considers it from the following two aspects:

1. Linear regression estimation. When the auxiliary information is some continuous auxiliary variables such as height and income, and when there is a linear relationship between the auxiliary variables and their research variables (weight, expenditure, etc.), a linear regression model between the two can be established to obtain a generalized regression estimator (GREG).There can be one or more auxiliary variables here, corresponding to univariate regression and multiple regression models respectively.

2. Nonparametric regression estimation. When the linear correlation is obviously not established between the research variable and the auxiliary variable, or the relationship between the two is uncertain, it can be considered not to make assumptions about the specific functional relationship between the two. Furthermore, a generalized nonparametric regression model is established in the functional form. For different situations, corresponding nonparametric regression models can be established respectively, and different nonparametric estimators can be constructed by using local polynomial regression, penalized spline estimation and other methods.

In the sampling estimation stage, based on the correlation between the research variables and auxiliary variables, a regression model between the two is constructed to describe the relationship between the two, so that the auxiliary information can be directly entered into the estimator, thereby improving the accuracy of sampling estimation. Due to the importance of the regression model to the sampling estimation accuracy, this subsection mainly introduces the super-population regression model in the sampling theory mentioned in the previous subsection.

First, we set $U=\{1,\cdots k,\cdots,N\}$ as a finite population with N population units. For any $k\in U$, the research variable of the kth population unit is denoted as y_k, and the corresponding auxiliary variable is denoted as x_k.Then, according to a certain sampling design, a sample s is drawn from the finite population U, the sample size is n, and the probability is $\Pr(s)$. $\pi_k=\Pr(k\in s)=\sum_{k\in S}\Pr(s)>0$ and $\pi_{kl}=\Pr(k,l\in s)=\sum_{k\&l\in S}\Pr(s)>0$ denote the first-order inclusion probability of the k-th unit and the second-order inclusion probability of the k-th and l-th units, respectively.In the sampling estimation stage, our research goal is how to estimate the total value $Y=\sum_U y_k$ of the research variable according to the survey information and other auxiliary information in the sample s.

A new kind of randomness is introduced into the super-population model (denoted as ξ), which can be called population randomness. It is considered that the variable value $\{(y_k,x_k)\}$ of the N units of the population U is a random sample of the super-population. Taking a single auxiliary variable as an example, the general form of the hyperpopulation model is:

$$Y_k=m(x_k)+\varepsilon_k \tag{1}$$

Among them, $E_\xi\left(\varepsilon_k\right)=0, V_\xi\left(\varepsilon_k\right)=\sigma^2<\infty, E_\xi$ and V_ξ represent the expectation and variance of model ξ, respectively. For the convenience of expression, the random variable Y_k and its realization value y_k are no longer distinguished in the following text, and are represented by y_k.

We assume that the N values $\left\{\left(y_k, x_k\right)\right\}$ of the finite population U are observable, and $\hat{m}_{kU}$ is an estimate of the regression function $m\left(x_k\right)$ based on the population data using some estimation method.If $\hat{m}_{kU}$ is known, the design unbiased estimator about the overall total value can be obtained according to the generalized difference estimation method.At this time, it is necessary to construct a sample-based estimator $\hat{m}_{ks}$ to replace $\hat{m}_{kU}$, and then obtain a model-assisted sampling estimator about the overall total value Y, which is recorded as:

$$\hat{Y}=\sum_U \hat{m}_{ks}+\sum_s \frac{y_k-\hat{m}_{ks}}{\pi_k} \tag{2}$$

Therefore, it is very critical to obtain the estimation method of the sample estimator $\hat{m}_{ks}$. Using different regression estimation methods will obtain different forms of model-assisted regression estimators.

For a finite population U, we assume that the value of the research variable $y_k(k=1,2,3\cdots N)$ is unknown, and the value of the auxiliary variable $x_k(k=1,2,3\cdots N)$ is known.Furthermore, we draw a sample s from a finite population U according to sampling design $\Pr(.)$ j.We can obtain observations $\left(y_k, x_k\right)$ for each sample unit $k\in s$. For the unit $k\in U-s$ in the non-sample set, the observation value of its auxiliary variable x_k can also be obtained. If it is assumed that the overall parameter estimated in this paper is the overall total value $Y=\sum_U y_k$ of the research variable y, the derivation process of its estimator is as follows:

The first step is to establish a linear super-population regression model to describe the relationship between auxiliary variables and research variables. We assume that the value $\left\{\left(y_k, x_{1k},\cdots x_{Jk}\right): k=1,2,\cdots,N\right\}$ of the study variable for N population units is randomly generated by the linear superpopulation regression model xi. Among them, the research variable y is the dependent variable in the hyper-population model ξ, and the auxiliary variable $x_1,\cdots,x_J$ Cis the corresponding independent variable in the model. Specifically, the linear hyperpopulation regression model ξ must be based on the following three conditions:

1. The observation value $\{(y_k, x_{1k}, \cdots x_{Jk}) : k = 1, 2, \cdots, N\}$ of N units of the finite population U is a random sample of the superpopulation;
2. $E_\xi(Y_k) = \sum_{j=1}^{J} \beta_j x_{jk} (k = 1, \cdots N)$;
3. $V_\xi(Y_k) = \sigma_k^2 (k = 1, \cdots, N)$;

Among them, E_ξ and V_ξ represent the expectation and variance of model ξ, respectively, and $\beta_1, \cdots \beta_J$ and $\sigma_1^2, \cdots \sigma_N^2$ are the parameters of the model.

The second step is to solve the sample estimator $\hat{\beta} = (\hat{\beta}_1, \cdots \hat{\beta}_J)$ of parameter $\beta = (\beta_1, \cdots \beta_J)$ in the model. Before this, it is assumed that the observation value of each unit of the finite population U, that is, $\{(y_k, x_{1k}, \cdots x_{Jk}) : k = 1, 2, \cdots, N\}$, can be obtained. Then, under the linear super-population regression model, the weighted least squares estimator of the regression coefficient $\beta = (\beta_1, \cdots \beta_J)$ is:

$$\hat{\beta} = (\hat{\beta}_1, \cdots, \hat{\beta}_J)' = \left(\sum_U x_k x_k' / \sigma_k^2 \right)^{-1} \sum_U x_k y_k / \sigma_k^2 \tag{3}$$

Its matrix form is $\hat{\beta} = (\mathrm{X}\Sigma^{-1}\mathrm{X}')^{-1} X\Sigma^{-1}Y$. Among them, X is a $J \times N$ -dimensional matrix, $Y = (y_1, \cdots, y_N), \Sigma$ is a $N \times N$ -dimensional diagonal matrix, that is:

$$\Sigma = \begin{bmatrix} \sigma_1^2 & \cdots & 0 \\ \vdots & \ddots & \vdots \\ 0 & \cdots & \sigma_N^2 \end{bmatrix}.$$

In the above linear super-population regression model, the parameter value $\hat{\beta}$ corresponding to the population is calculated according to each observation value of the population data, that is, $\hat{\beta}$ is the description of the finite population characteristics. $\hat{\beta}$ can be expressed in the following form:

$$\hat{\beta} = T^{-1}t \tag{4}$$

Here is $T = \sum_U \frac{x_k x_k^{'}}{\sigma_k^2}; t = \sum_U \frac{x_k y_k}{\sigma_k^2}$.

According to the definition of π estimator, the unbiased π estimators of T and t can be obtained as:

$$\tilde{T} = \sum_s \frac{x_k x_k^{'}}{\sigma_k^2 \pi_k}; \quad \tilde{t} = \sum_s \frac{x_k y_k}{\sigma_k^2 \pi_k}$$

Then, the estimated π of the population parameter $\hat{\beta}$ using the sample data is:

$$\begin{aligned} \tilde{\beta} &= \left(\tilde{\beta}_1, \cdots \tilde{\beta}_J\right)^{'} \\ &= \tilde{T}^{-1}\tilde{t} = \left(\sum_s \frac{x_k x_k^{'}}{\sigma_k^2 \pi_k}\right)^{-1} \sum_s \frac{x_k y_k}{\sigma_k^2 \pi_k} \end{aligned} \tag{5}$$

Here, $\hat{\beta}$ is the estimator of the hyper-population model parameter β under the assumption that the overall unit information is known, and $\tilde{\beta}$ is the asymptotic unbiased estimator of $\hat{\beta}$.

In the third step, after the parameter estimation $\tilde{\beta}$ of the model ξ is obtained, the expression of the generalized regression estimator (GREG estimator) is obtained, which is denoted as $\hat{Y}_{GREG}$, and its specific expression is:

$$\hat{Y}_{GREG} = \sum_s y_k / \pi_k + \sum_{j=1}^{J} \tilde{\beta}_j \left(\sum_U x_{jk} - \sum_s x_{jk} / \pi_k \right) \tag{6}$$

It can be seen from the above formula that the generalized regression estimator is an adjustment term added to the π estimator. When the estimation accuracy of the generalized regression estimator is very high, in general, the size of the adjustment term is negatively correlated with the error of the π estimator. At this time, the estimation accuracy of the GREG estimator will be significantly higher than that of the π estimator.

Regression analysis method is the most used method in applied data analysis. So far, the most common parametric regression model is still the linear regression model, that is:

$$Y_i = \beta_0 + X_i^{'}\beta + u_i, i = 1, \cdots n \tag{7}$$

Among them, there is $X_i \in R^p, \beta$ is the $p \times 1$ -dimensional regression parameter vector to be estimated.

However, nonparametric regression models do not require researchers to make specific functional assumptions about the relationship between variables. Therefore, if we guess that a parametric model has a certain degree of model setting error, and the sample size is large enough, we can consider using nonparametric regression estimation.

The form of the nonparametric regression model can be expressed as:

$$Y_i = g\left(x_i\right) + u_i, \quad i = 1, \cdots, n \tag{8}$$

Among them, $\left(Y_i, X_i\right)$ is independent and identically distributed, and the functional form of function $g(\cdot)$ is unknown. For example, if $g(\cdot)$ is assumed to be a smooth function, a kernel estimation method may be chosen to estimate $g(\cdot)$, among them, there is $g(x) = E\left(Y_i \middle| X = x_i\right)$.

Since the form of the nonparametric regression function can be arbitrary and is not constrained by any conditions, it is the characteristic of the nonparametric regression model, and the form of the superpopulation nonparametric regression model ξ is set as:

$$Y_k = m\left(x_k\right) + \varepsilon_k \tag{9}$$

Among them, ε_k represents an independent random error term with a mean of 0 and a variance of $v\left(x_k\right); m\left(x_k\right)$ is a smooth function about x_k whose expression is unknown.

Under model ξ, firstly, based on the observations of the entire finite population, the estimator m_k is obtained according to some nonparametric method. However, in the actual survey, the overall data is not known, so m_k cannot be calculated. Therefore, based on the surveyed sample data, the design weights are used to obtain the sample-based estimator $\hat{m}_k$ of $m\left(x_k\right)$, so as to obtain the nonparametric regression estimator under the condition of the auxiliary model, denoted as $\hat{Y}$, which can be expressed as:

$$\hat{Y} = \sum_U \hat{m}_k + \sum_s \frac{Y_k - \hat{m}_k}{\pi_k} \tag{10}$$

According to the specific form of m_k, different non-parametric estimation methods are selected to estimate m_k, so different estimation methods of m_k will obtain different estimators. This section mainly introduces the application of local polynomial estimation method and penalized spline estimation method in model-aided estimation.

(1) Based on the non-parametric regression estimator of local polynomial, the specific expression of the local polynomial regression estimator is given when the first-order sampling and auxiliary variables are unary. If it is assumed that the q+1 derivative of the unknown model regression function $m(x)$ at $x = x_k$ exists, the Taylor series expansion of $m(x)$ at $x = x_k$ is:

$$m(x) \approx m\left(x_k\right) + m'\left(x_k\right)\left(x - x_k\right) + \cdots + m^{(q)}\left(x - x_k\right)^q \tag{11}$$

For the overall unit $\{y_l, x_l\}_{l=1}^{N}$, we have

$$y_l = m\left(x_k\right) + m'\left(x_k\right)\left(x_l - x_k\right) + \cdots + m^q\left(x_k\right)\left(x_l - x_k\right)^q + \varepsilon, l = 1, \cdots, N \tag{12}$$

For the polynomial (12), the weighted least squares method is used for local fitting, and $\sum_{k=1}^{N}\left[y_l - m_l\right]^2 K\left(\frac{x_l - x_k}{h}\right)/h$ is minimized in the neighborhood $\left(x_k - h, x_k + h\right)$ of x_k.

Among them, K is a continuous kernel function:

$$X_{Uk} = \begin{bmatrix} 1 & x_1 - x_k & \ldots & \left(x_1 - x_k\right)^q \\ \vdots & \vdots & & \vdots \\ 1 & x_N - x_k & \ldots & \left(x_N - x_k\right)^q \end{bmatrix} = \begin{bmatrix} 1 & x_l - x_k & \ldots\left(x_l - x_k\right)^q \end{bmatrix}_{l \notin J}$$

The population-based estimator m_k to obtain $m\left(x_k\right)$ is:

$$m_k = e_1'\left(X_{Uk}' W_{Uk} X_{Uk}\right)^{-1} X_{Uk}' W_{Uk} Y_U \tag{13}$$

Among them, there is $Y_U = \left[y_k\right]_{k \in U}$, $W_{Uk} = \operatorname{diag}\left\{\frac{1}{h} K\left(\frac{x_l - x_k}{h}\right)\right\}$ is the weight matrix, and e_1 is the column vector whose first position is 1 and the remaining positions are 0.

Since only y_k in sample $s \subset U$ is known, $Y_s = \left[y_k\right]_{k \in s}$ is denoted as an n-dimensional column vector consisting of y_k in sample s. Similarly, based on the sample matrix $X_{sk} = \begin{bmatrix} 1 & x_l - x_k & \ldots\left(x_l - x_k\right)^q \end{bmatrix}_{l \in s}$ is defined.

Then, the sample-based estimator of $m\left(x_k\right)$ is:

$$\hat{m}_k = e_1^{'}\left(X_{sk}^{'}W_{sk}X_{sk}\right)^{-1}X_{sk}^{'}W_{sk}Y_s \tag{14}$$

Among them, $W_{sk} = \text{diag}\left\{\frac{1}{\pi_l h_N}K\left(\frac{x_l - x_k}{h_N}\right)\right\}$ is the sample-based weight matrix considering the design weight. Then, according to the formula, the local polynomial regression estimator of the overall total value under the model-aided condition can be obtained as:

$$\begin{aligned}\hat{Y} &= \sum_U \hat{m}_k + \sum_s \frac{Y_k - \hat{m}_k}{\pi_k} \\ &= \sum_U e_1^{'}\left(X_{sk}^{'}W_{sk}X_{sk}\right)^{-1}X_{sk}^{'}W_{sk}Y_s + \sum_s \frac{Y_k - e_1^{'}\left(X_{sk}^{'}W_{sk}X_{sk}\right)^{-1}X_{sk}^{'}W_{sk}Y_s}{\pi_k}\end{aligned} \tag{15}$$

(2) Nonparametric regression estimator based on penalized spline method

Proposed to use penalized spline method to estimate $m\left(x_k\right)$ under the condition of first-order sampling and the auxiliary variable is unary. If the entire finite population can be observed, the estimator that defines the function $m(\cdot)$ is:

$$m(x) \approx \beta_0 + \beta_1 x + \cdots \beta_q x^q + \sum_{l=1}^{L}\beta_{q+l}\left(x - \kappa_l\right)^q + \tag{16}$$

Among them, $(t)^q = \max\left\{0, t^q\right\}, q$ is the order of the spline, $1, x, \cdots x^q, \left(x-\kappa_1\right)_+^q, \cdots\left(x-\kappa_L\right)_+^q$ is the power spline basis, and $\kappa_l\left(\kappa_1 < \cdots < \kappa_L\right)$ is called the fixed node. The vector $\beta = \left(\beta_0, \cdots \beta_{q+L}\right)^T$ is defined as the coefficient vector.

The finite population-based penalized least squares estimate B_U of β is the solution that minimizes $\sum_{k\in U}\left\{y_k - m\left(x_k, \beta\right)\right\}^2 + \alpha\sum_{l=1}^{L}\beta_{q+l}^2$ .Among them, $\alpha \geq 0$ is a fixed constant, vector $X_k^T = \left\{1, x_k, \cdots, x_k^q, \left(x_k - \kappa_1\right)_+^q, \cdots\left(x_k - \kappa_L\right)_+^q\right\} \quad \text{k} \in U_N$ and matrix $X = \left(X_1^T, \cdots X_N^T\right)^T$ are recorded, and the variable vector $Y = \left\{y_k\right\} \text{k} \in U$ is studied. The diagonal matrix

$A_\alpha = \mathrm{diag}\{0,\cdots 0,\alpha,\cdots,\alpha\}$ is defined, and there are q+1 0s and L penalty constants α in the diagonal elements, then the coefficient vector penalized least squares estimator is:

$$B_U = \left(X^T X + A_\alpha\right)^{-1} X^T Y_U \tag{17}$$

Then, the population-based estimator m_k of $m(x_k)$ is:

$$m_k = m(x_k, B_U) \equiv X_k^T B_U \tag{18}$$

The design weight matrix is denoted as $W = diag_{k\in U}\{1/\pi_k\}$, and the matrix corresponding to its samples is $W_s = \mathrm{diag}_{k\in s}\{1/\pi_k\}$. A similar notation matrix X_s is the sample-based matrix corresponding to matrix X, and its row vector consists of X_j^T and there is $j \in s$. Similarly, the vector y_s can be defined. For a fixed α and properly specified conditions, the π -weighted estimator of β is:

$$\hat{\beta} = \left(X_s^T W_s X_s + A_\alpha\right)^{-1} X_s^T W_s X_s Y_s \tag{19}$$

Then, there is

$$\hat{m}_k = m\left(x_k; \hat{\beta}\right) \equiv X_k^T \hat{\beta} \tag{20}$$

Then, the penalized spline estimator under the model auxiliary condition is obtained as:

$$\hat{Y}_{spl} = \sum_U \hat{m}_k + \sum_s \frac{y_k - \hat{m}_k}{\pi_k} \tag{21}$$

The basic idea of semiparametric product tuning is introduced:

We assume that n pairs of independent and identically distributed observations are (X_i, Y_i), and consider the following regression problem:

$$m(x) = E(Y|\ X = x) \tag{22}$$

Ideas can be expressed as follows:

$$m(x) = m(x,\beta)\cdot\frac{m(x)}{m(x,\beta)} \tag{23}$$

For the first part on the right side of the equation, the parameter estimation $m(x,\hat{\beta})$ is used, and the second part is called the adjustment factor, and it is expressed as: $r(x)=\dfrac{m(x)}{m(x,\hat{\beta})}$. Then, the nonparametric estimation method is used to obtain its estimator $\hat{r}(x)$. Because this estimation method combines parametric and nonparametric estimation methods, it can be called semiparametric estimation. Specifically, it can be called semiparametric product estimation, and its expression is:

$$\hat{m}(x)=m(x,\hat{\beta})\cdot\hat{r}(x) \tag{24}$$

For the estimation of the initial parameter part $m(x,\hat{\beta})$, any form of parameter estimation method can be adopted. Either simple linear regression techniques or complex nonlinear regression methods can be employed. However, in most cases, simple parameter estimation can already obtain very good estimation results. For the estimation of the adjustment term r(x), in theory, any form of nonparametric estimation method can be chosen. However, in view of the advantages of the local polynomial estimation method, it is often chosen to use the local polynomial estimation to obtain its estimator $\hat{r}(x)$.

When r(x) is estimated by the p -order local polynomial, its estimator can be obtained as:

$$\hat{r}(x,p)=e_1^T\left(X^TWX\right)^{-1}X^TWV \tag{25}$$

Among them, $W=\operatorname{diag}\left(K_h\left(X_t-x\right)\right), e_1$ is a p+1-order vector whose first item is 1 and the rest p items are 0, and there is $V=\left(Y_1/m\left(x_1,\hat{\beta}\right),\cdots,Y_n/m\left(x_n,\hat{\beta}\right)\right)$.

Then, there is

$$\hat{m}(x)=m(x,\hat{\beta})\cdot e_1^T\left(X^TWX\right)^{-1}X^TWV \tag{26}$$

4 INNOVATIVE PRACTICE OF DISCIPLINE TALENT TRAINING IN UNIVERSITY LIBRARY

According to the specific requirements of performance evaluation and the actual situation of the library, the performance evaluation system is divided into information input module (internal information and external information), performance evaluation module, policy information module, management and maintenance module, query module. This evaluation system can be hung on the home page of the library, and the login of the performance evaluation home page requires the authorization of the management maintainer. Moreover, different levels have different rights, and the direct evaluator not only has the right to view, but also has the right to modify the evaluation information and results, as shown in Figure 1.

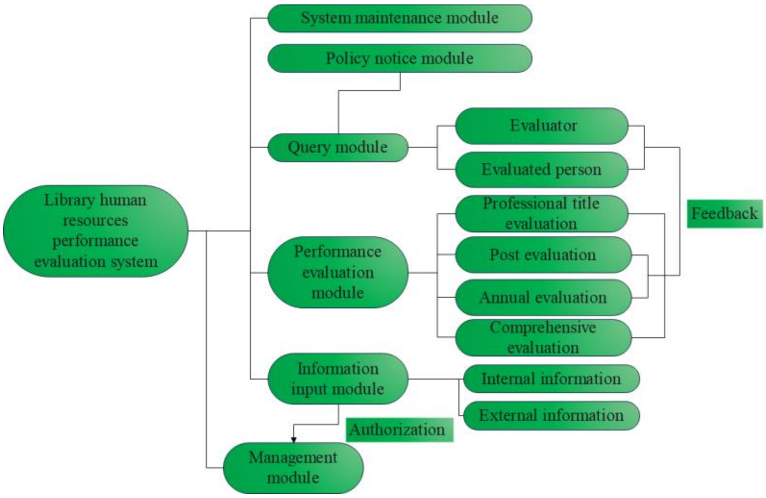

Figure 1: Model diagram of library human resources performance evaluation system.

The implementation of library staff performance appraisal should be a planned, purposeful, step-by-step, and gradual process. It is the basic idea of total quality management, as shown in Figure 2.

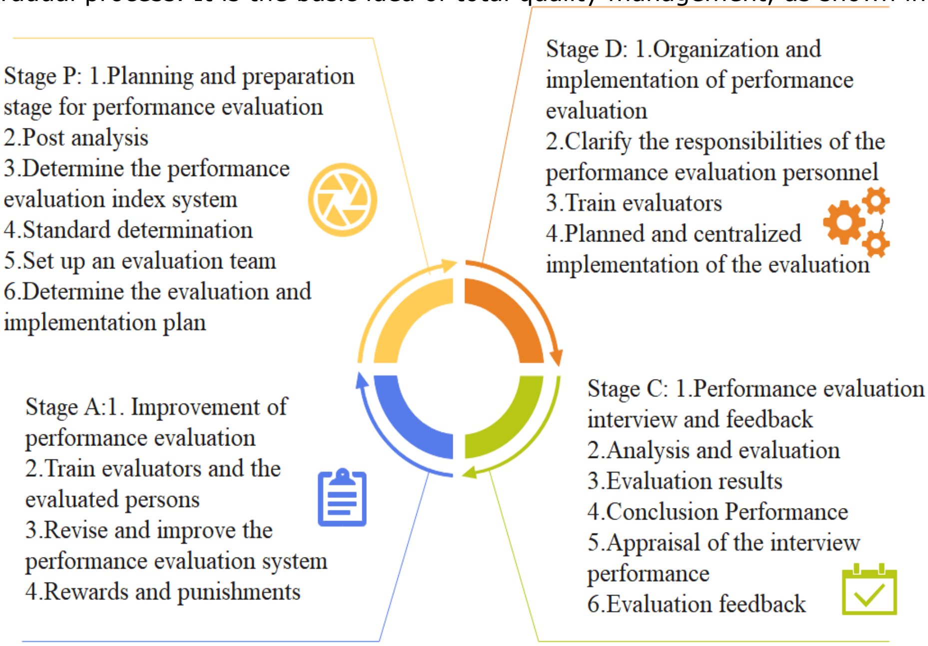

Figure 2: PDCA process of performance appraisal.

According to the PDCA process of the above performance evaluation, in order to achieve the expected effect, the performance evaluation of library staff in colleges and universities generally needs to be implemented in the specific operation as shown in Figure 3.

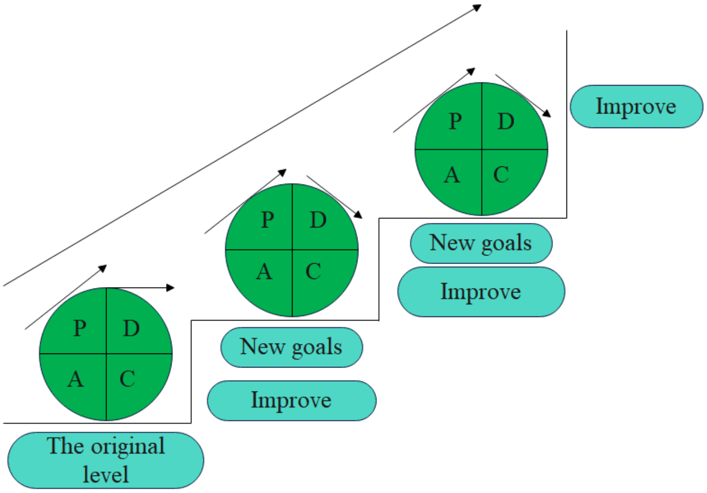

Figure 3: PDAC cycle diagram.

With reference to the existing achievements of the index system research, the following subject administrator performance evaluation index system is constructed, as shown in Figure 5.

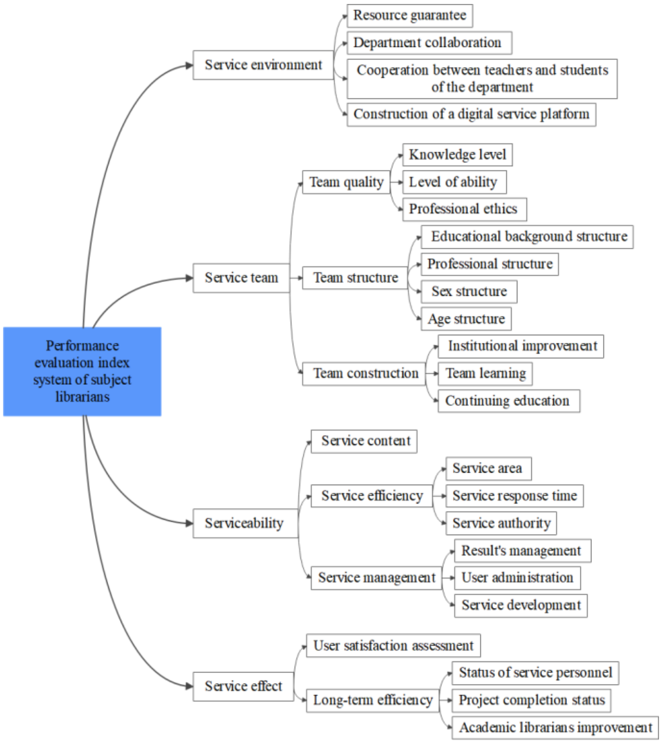

Figure 4: Subject administrator performance evaluation index system.

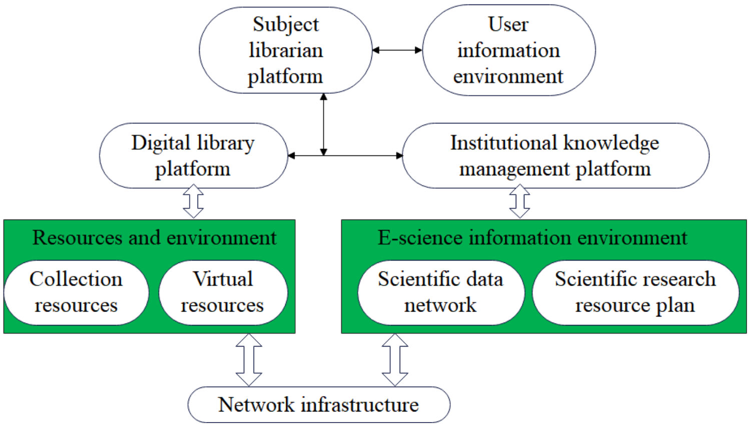

Figure 5: Subject administrator service mode based on digital library.

This paper regards the university library and subject development as a dynamic system, describes the process and mechanism of the service level of the university library to the discipline development as a whole, and builds a conceptual model of the impact of the university library on the performance of the discipline development as shown in Figure 6.

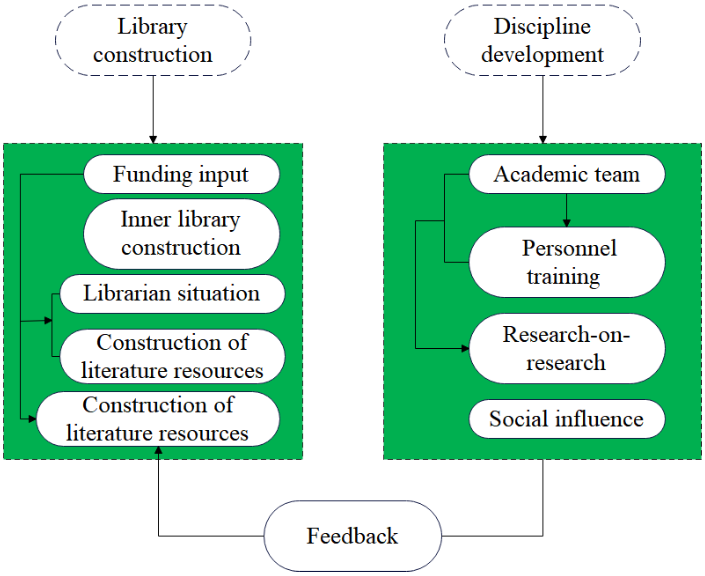

Figure 6: Conceptual model of the impact of university library on the performance of discipline development.

On the basis of a comprehensive analysis of the causal relationship and feedback mechanism between university library and discipline construction, the following conceptual model of the interaction between university library development and discipline construction is established, as shown in Figure 7.

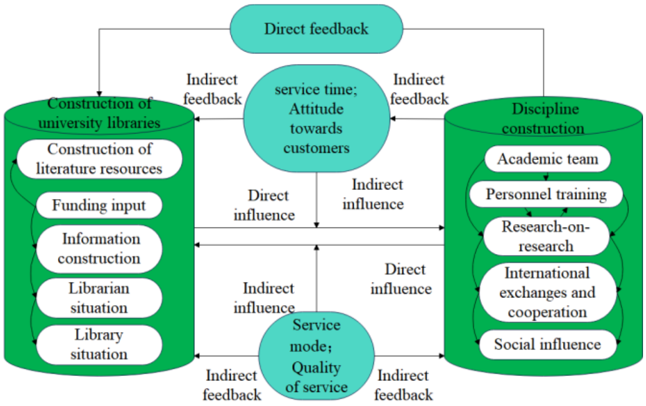

Figure 7: Conceptual model of university library and discipline construction.

Subject librarians engaged in professional counterpart services, while engaging in specific information resource organization and management, provide professional counterpart services through the communication platform built by the library website. The reference consultants on the education platform are mainly library subject librarians, and are jointly participated by experts from some auxiliary scientific research institutes and professional teachers from departments as "image professors", as shown in Figure 8.

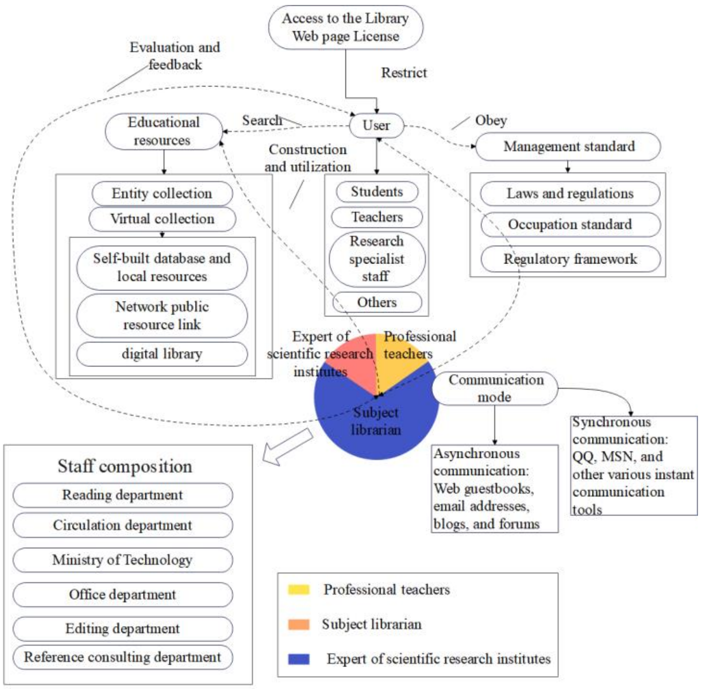

Figure 8: Schematic diagram of the educational network platform based on the subject librarian system.

Combined with the algorithm in the third part, the distribution clustering of the current university library discipline talent training skills is studied, and the simulation diagram shown in Figure 10 below is obtained.

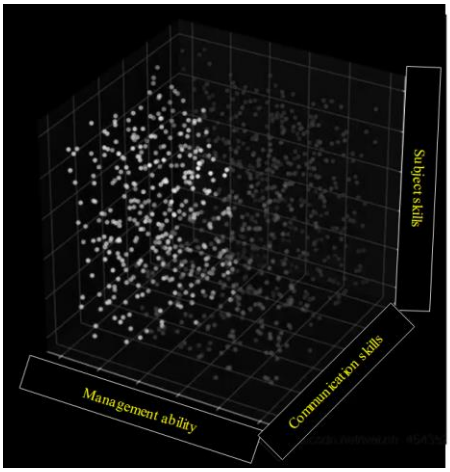

Figure 9: Clustering simulation map of talent training skills distribution in library disciplines.

On the basis of the above research, this paper evaluates the promotion effect of the method proposed in this paper on the innovation of subject personnel training in university libraries, and conducts research combined with the expert evaluation method, and the results shown in Table 1 are obtained.

Num	*Evaluation data*	*Num*	*Evaluation data*	*Num*	*Evaluation data*
1	*79.72*	*19*	*79.83*	*37*	*80.50*
2	*74.92*	*20*	*78.53*	*38*	*83.25*
3	*77.77*	*21*	*76.15*	*39*	*85.98*
4	*83.22*	*22*	*80.68*	*40*	*80.45*
5	*81.24*	*23*	*85.85*	*41*	*84.12*
6	*83.88*	*24*	*79.46*	*42*	*84.98*
7	*87.10*	*25*	*77.15*	*43*	*87.12*
8	*87.84*	*26*	*85.06*	*44*	*81.89*
9	*78.03*	*27*	*81.16*	*45*	*75.54*
10	*78.17*	*28*	*78.59*	*46*	*77.20*

11	*76.10*	*29*	*84.50*	*47*	*83.73*
12	*86.38*	*30*	*83.82*	*48*	*87.82*
13	*75.81*	*31*	*81.29*	*49*	*79.40*
14	*80.93*	*32*	*76.21*	*50*	*75.27*
15	*74.39*	*33*	*75.58*	*51*	*81.08*
16	*84.19*	*34*	*87.08*	*52*	*77.82*
17	*80.05*	*35*	*79.07*	*53*	*80.08*
18	*74.31*	*36*	*80.67*	*54*	*83.37*

Table 1: The promotion effect of the method proposed in this paper on the innovation of subject personnel training in university libraries.

From the above research, it can be seen that the method proposed in this paper has a very obvious effect on promoting the innovation of subject personnel training in university libraries.

5 CONCLUSION

The advent of the knowledge economy has led to changes in the demand for social talents and changes in general higher education. At the same time, it also provides favorable social environment and opportunities for the scientific development of university libraries. Institutions of higher learning are important positions for teaching and scientific research, and the cradle for cultivating innovative talents. At the same time, the university library, as the document center of the university, is indispensable for its document information service guarantee function, and its status will further rise.This paper studies the innovation time of university library personnel training based on the needs of modern universities for library discipline talents. Combined with the research conducted by the expert evaluation methods, the method proposed in this paper has a very obvious effect on promoting the innovation of subject personnel training in university libraries.

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