Analysis of Main Factors Affecting the Construction of Harmonious Campus and its Coupling Law

LIU Silin

Sichuan Agricultural University, Ya'an 625014, China, liusilin2012@126.com

Keywords: Harmonious campus; Coupling law; Factor analysis; Principal component

Abstract. The construction of a harmonious campus is an important part of building a harmonious society. It has an important role in promoting the construction of harmonious society. Harmonious campus construction is a premise to provide a reliable guarantee of teaching and education, and key support for the contemporary youth education. It is one problem of the contemporary education teaching which must be solved. Based on the literature and personal experience, the paper analyzed the basic connotation and characteristics of the construction of harmonious campus. Through factor analysis method, it analyzes the coupling law of the factors affecting harmonious campus building deeply. And then, by principal component analysis method, it designs strategic decision model for harmonious campus construction. It provides theoretical basis and strategic decision support for the construction of a harmonious campus to some degree.

Introduction

The construction of a harmonious society is inseparable from the building of harmonious campus, and harmonious people are an important component of the harmonious society. To build a harmonious society, we should constitute a harmonious campus firstly. University is an important base and guarantee for China's education and training of talents, so the construction and quality of a harmonious campus has a direct impact on the result of the construction of harmonious society [1]. Stop playing favoritism and committing irregularities, resist corruption and a series of phenomenon like these, to ensure the smooth implementation of democratic decision-making. We design the democratization and scientific construction program, and regard achieving the completion of transparent democracy, relaxed and lively harmonious campus as the ultimate goals. We encourage everyone airs his own views and participate in the decision making of school actively. Because the campus is a complex multifactor unified body, through the connotation of various parts of the harmonious campus, we understand the changes and the relationship between the elements. Under the condition that these factors merge, develop and operate together, we create a harmonious and healthy state full of vigor and vitality. These important elements keep in interdependent, harmoniously developing, promoting each other state for a long time, ensure the orderly operation of the harmonious campus. Teaching reform is the inexhaustible source of the development of education. It is the important power to solve problems in the practice of teaching efficiently and scientifically, to seek to explore new ideas. Only by constantly deepening reform can we promote the development of harmonious campus. The construction of a harmonious campus should also adhere to the people-oriented ideology, and regard achieving the comprehensive development of man as the main target. Campus vitality is an important basis and premise for constructing harmonious campus and guaranteeing school development. In addition to the peaceful coexistence and mutual help between school members, the effective mechanism of organization and system. We should strengthen the potential development of the individual student, and create free innovation, fair survival, developing environment for the teachers and students, then we can promote the campus full of vitality.

Connotation and characteristics of the harmonious campus construction

A. Connotation of the harmonious campus construction

Training a creative type talented person, it needs to open, democracy, freedom, harmonious campus environment. Only in a harmonious campus environment, the student's creation thinking can correct development, but innovate the talented person of ability, can with maximum limit develop their creation potential; Only in a harmonious campus environment, and produce more creations from here achievement. The harmonious campus environment can bring the free discussion of the student's and make the school manages of more democratization, all these can produce active thinking, and the student's the fusion for though ting, promote the creation of creating sex thinking thus. Promote so-called 100 blossomy academic environments of a harmonious campus environment atmosphere assertion, the encouragement student's, the friendly relation establishment of the teachers and the students' encourage that teacher and student together discuss a problem. The core idea and value trend of harmonious campus is cooperation of inside and outside, pulling together in times of trouble, and coordinated development. Campus is an important link between elements of education. It supports the comprehensive coordinated and free optimized development of the harmonious campus [2].

The connotation of harmonious campus is interpreted from different point of view, the conclusions are also different. Organization structure elements of harmonious campus include: teaching practice, scientific research, administration, and logistics services. Every department takes its own responsibility and cooperates harmoniously with each other. The elements of harmonious campus school resource includes: the school's human, material and financial land resources and so on. Interpersonal relationship elements of harmonious campus mainly includes: teachers, students, logistics, administrators and other school personnel. The school operating elements of harmonious campus mainly includes [3]: the harmonious development between scientific research and teaching, mutual promotion between scientific education and humanistic education, mutual coordination between professional education and quality education [4], mutual promotion between professional construction and subject construction, interaction between software construction and hardware construction, administration and teaching complement each other and so on.

B. The characteristic of the harmonious campus construction

Harmonious campus has the typical characteristics of harmonious society; therefore harmonious campus is a small harmonious society. Every university has its own characteristics, and thus a harmonious campus also has its own distinct characteristics. Through innovated reform and scientific development, ordinary colleges and universities eventually form harmonious campus which has high-quality educational qualifications and can quickly solve the problem during the process of teaching practice [5].

Analysis of influencing the construction factors of harmonious campus coupling law

The harmonious education environment is equity, there is preface, reasonable of the environment is to improve student's quality and strengthen study knowledge intensive degree and raise student's ability and make them more careful with pragmatic warm and fragrant harmonious campus atmosphere. We not only need to insist taking student as origin of principle, concern the student's health, and think that the square tries the problem of solving the student and contributes efforts to their growths as far as possible and creates a harmonious and healthy education environment in the campus at the same time, also need to value an of teacher and student of friendly relation, give teacher and student of the active of and full exertion of the creation, form a mutual study, mutual cooperation and elevated good environment mutually; Continuing to construct a campus environment of harmonious stability hard, carry out of school and peripheral environment, student and surroundings harmonious environment. The primary task of constructing harmonious campus is to reform, combined with their situation and development trend, based on the development connotation of harmonious campus, which will go a long way innovative.

The use of the important ideas of scientific development outlook resolves major problems in campus, and can be comprehensive, coordinated, efficient completion of an important goal of

building a harmonious society. Analysis of factors affecting the construction of a harmonious campus coupling law is the core factor analysis of some comprehensive index and extract the common factor, then the contribution rate of each factor variance as score multipliers and score function is constructed the weight factor. Factor analysis method is expressed by the mathematics matrix $X = AF + B$, namely:

$$
\begin{cases}
x_1 = \alpha_{11}f_1 + \alpha_{12}f_2 + \alpha_{13}f_3 + \cdots \alpha_{1k}f_k + \beta_1 \\
x_2 = \alpha_{21}f_1 + \alpha_{22}f_2 + \alpha_{23}f_3 + \cdots \alpha_{2k}f_k + \beta_2 \\
x_3 = \alpha_{31}f_1 + \alpha_{32}f_2 + \alpha_{33}f_3 + \cdots \alpha_{3k}f_k + \beta_3 \quad k \le p \\
\cdots\cdots \\
x_p = \alpha_{p1}f_1 + \alpha_{p2}f_2 + \alpha_{p3}f_3 + \cdots \alpha_{pk}f_k + \beta_p
\end{cases}
\tag{1}
$$

In formula (1), the vector $X(x_1, x_2, x_3, \cdots, x_p)$ can be observed random vector, namely original observed variables; $F(f_1, f_2, f_3, \cdots, f_k)$ is a common factor of $X(x_1, x_2, x_3, \cdots, x_p)$, namely the appeared together factor in the expression of each original observed variables that is not observable theory variables of mutual independent. From another point of view, the harmonious campus is the culture high-quality personnel of the needs of a harmonious society, constantly promoting the harmony between teachers and students, and efficient learning education research. Harmonious campus as students grow up the system place of smoothly and healthy development, it contains the humanities, science, democracy and open education position, which can build a new harmonious order, arousing people's enthusiasm and giving play to the overall effect of harmonious society. Common variable degree is i-th square of factor loading matrix A, which can be expressed as $h_i^2 = \sum_{j=1}^{k} \alpha_{ij}^2 \quad (i = 1, 2, \cdots, p)$.

The measure of all common factors makes the contributions on x_i variance, these elements need to full coordination, it can make use of the school resources to achieve the maximization, realizing the harmonious development in many aspects of quality, scale, structure and benefit, which can realize real ecological benefit and the construction and unification of high economic benefit harmonious society, and can reflect all public factor on the effect of variable x_i. At the same time, h_i^2 is bigger, it shows that X is larger for the each component dependence of F. For the both sides of formula (1), and we can both solve the variance, to get:

$$
Var(x_i) = \alpha_{i1}^2 Var(f_1) + \alpha_{i2}^2 Var(f_2) + \cdots
$$
$$
+ \alpha_{ik}^2 Var(f_k) + Var(\beta_i) = \sum_{j=1}^{k} \alpha_{ij}^2 + \sum_{i=1}^{p} \beta_i^2
\tag{2}
$$

In formula (2), when the value of $h_i^2 = \sum_{j=1}^{k} \alpha_{ij}^2$ and $Var(x_i)$ are approximation, and β_i^2 is very small, these elements will be interrelated special organization of society according to certain rules regulate, various interest groups can be compatible symbiosis in the practice of harmonious campus, to establish a good mutual trust relationship between teachers and cadres. At the same time, teaching, scientific research and management team also can collaboration complete the important tasks of building harmonious campus; between employees and retirees force, they can resolve contradictions, mutual tolerance, in order to promote the great power for the harmonious campus building.

The operation factors of these constitutions of harmonious campus school are coordinated orderly and healthy development, which are the important guarantee of the coherence balanced operation of maintaining teaching, scientific research and management order. In the factor loading matrix, the square of each column is expressed as $g_j^2 = \sum_{i=1}^{p} \alpha_{ij}^2 (j = 1, 2, \cdots, K)$, and g_j^2 is called for the analysis of the influencing of harmonious campus construction factors' coupling law common factor $F(f_1, f_2, f_3, \cdots, f_k)$ that is $X(x_1, x_2, x_3, \cdots, x_p)$ variance contribution, it is said that the $j-th$ common factor f_i provides the sum of the variance for each component $x_i (i = 1, 2, \cdots, p)$ of x, which is a measure of the relative importance index of the common factors.

Harmonious coexistence between each parts environment and relations provide a good

ecological environment, rich atmosphere and beautiful living environment for the harmonious campus, the teachers and researchers can be efficient teaching and research activities in the comfort of campus. Then the formula (2) can be transformed for:

$$Var(x_i) = \alpha_{i1}^2 Var(f_1) + \alpha_{i2}^2 Var(f_2) + \cdots$$
$$+ \alpha_{ik}^2 Var(f_k) + Var(\beta_i) = \sum_{j=1}^{k} g_j^2 + \sum_{i=1}^{p} \beta_i^2 \tag{3}$$

In formula (3), if g_j^2 is greater, it shows that the public factor $F(f_1, f_2, f_3, \cdots, f_k)$ has greater contribution on $X(x_1, x_2, x_3, \cdots, x_p)$, or that is also greater on the effects and the role of $X(x_1, x_2, x_3, \cdots, x_p)$. If the $g_j^2 (j = 1, 2, \cdots, k)$ of factor loading matrix A are all calculated, which can be extracted from the most influential public factor. Therefore, a harmonious campus cannot be separated from the mutual coordination, mutual interdependence, mutual promotion between campus internal elements, it needs to the school as the core, actively mobilizing the coordinated development of various elements full and free, building a good educational environment of whole optimization, following the teachers and school development coordination as the purpose, to improve school, family, social and other aspects of educational outcomes.

The construction of scientific harmonious campus construction strategic decision

Be closely combined with the students daily teaching management, the construction of student-centered is fully concerned about all aspects of the students situation changes, such as ideological, psychological, learning, life and so on, and combined with the characteristics of students in each growth stage, it should formulate the cultivation of high-quality talents with all-round development of morality, intelligence, body and beauty. On the personality development of students, we don't also neglect, as far as possible for students to provide various learning, living environment, cultivating the needs of more high quality social talents, building the scientific and harmonious campus construction strategic decision matrix:

$$R = \begin{bmatrix} r_{11} & r_{12} & \cdots & r_{1p} \\ r_{21} & r_{22} & \cdots & r_{2p} \\ \vdots & \vdots & & \vdots \\ r_{p1} & r_{p2} & \cdots & r_{pp} \end{bmatrix} \tag{4}$$

In formula (4), r_{11} ($i, j = 1, 2, \cdots, p$) is correlation coefficient of the original variables x_1 and x_j. For the construction of teachers, we should respect and care with creative and aggressive talent, which can retain talent for the construction of school, at the same time, from the social from all walks of life, we should attract more talents with the strong comprehensive ability, which can eventually play an important role in teaching, talent research and teaching management, enhancing the level of overall, so:

$$r_{ij} = \frac{\sum_{k=1}^{n} (x_{ki} - \bar{x}_i)(x_{kj} - \bar{x}_j)}{\sqrt{\sum_{k=1}^{n} (x_{ki} - \bar{x}_i)^2 \sum_{k=1}^{n} (x_{kj} - \bar{x}_j)^2}} \tag{5}$$

Through the fair competition, following the rules of the nature survival fittest, not matter what we start the personal or collective interests. We can not only protect fair competition, but also protect the interests of the winner. Harmony and contradiction coexist, not completely uniform, only changing and the development of things in the contradiction and competition, the things are organic unified and coordinated, so as to achieve a balanced state, we can respectively get the corresponding to eigenvector $e_i (i = 1, 2, \cdots, p)$ of eigenvalue λ_i, which requirements $\|e_{i=1}\|$,

namely e_{ij} is expressed vector the j-th component of e_i, and the calculation of the various factors on the harmonious campus construction contribution rate and the accumulated contribution rate as follows. The contribution rate is:

$$\lambda_i / \sum_{k=1}^{p} \lambda_k \quad (i = 1, 2, \cdots, p) \tag{6}$$

The cumulative contribution rate is:

$$\sum_{k=1}^{i} \lambda_k / \sum_{k=1}^{p} \lambda_k \quad (i = 1, 2, \cdots, p) \tag{7}$$

In formula (7), we will be comprehensive statistic the contribution rate and the cumulative contribution rate, and attach great importance to the construction of campus spiritual civilization, which is the society of honesty, friendship, harmony and noble unity ahead, giving full play to the university campus culture, to infect more teachers and students by the cultural propaganda. And inheriting and carry forward the fine traditions, establishing a good style of study, building a mutual respect, equality and mutual love teaching platform, mutual respect between teachers and students, leader at all levels are compassionate people that can push aside all obstacles and difficulties for teachers and students, which can fully mobilize the social sense of responsibility of each person and a sense of belonging.

Conclusions

In a harmonious stability and order campus, if the construction of harmonious campus can be positive interaction with external, it will not only be effective influence on surrounding the development of school and education, but also form the benign development of harmonious relationship, to reach the school health civilization harmony and unity. At the same time, the school with its unique campus culture and natural human can silently edify students′ sentiment, which can bring enlightenment for the teachers and students, and it will give full play to harmonious campus unique education function. The harmonious campus environment is the ideal place of growth that behaves just, and it is the important battlefield of the creative talented person's development. In order to foster an innovation talented person, the harmonious campus atmosphere developed a more and more obvious function in the training, it has become a kind of important education resources and talented person develops of core. Therefore, build on the foundation of harmonious campus up, for development innovation type talented person come to say, this is an extensive huge engineering, involve the way of thinking, principle of overall reform, concept and high education teaching and management, this needs the working talent of researcher and constructor study and creation is together.

References

[1] Jianfang Zhu, Shaoying Wang, "A Study on Improving Middle-and-Long Distance Running Performance of College Students with Segmented Intensity Indicator Training Method", JDCTA, Vol. 7, No. 2, pp. 335 - 342, 2013.
[2] Beena Patel, Pankaj Patel, "Sustainable campus of Claris lifesciences through green initiatives", Renewable and Sustainable Energy Reviews, Vol. 16, No. 7, pp. 4901-4907, 2012.
[3] Dong Haixiang, Tang Jingjing, "The Improved Shortest Path Algorithm and Its Application in Campus Geographic Information System", JCIT, Vol. 8, No. 2, pp. 34 - 40, 2013.
[4] Hiroshi Komiyama, "The Harmonious Development of Civilizations and the Role of Universities", Procedia - Social and Behavioral Sciences, Vol. 2, No. 5, pp. 6641-6643, 2010.
[5] Morris A Graham, "Acculturative stress among Polynesian, Asian and American students on the Brigham Young University—Hawaii campus", International Journal of Intercultural Relations, Vol. 7, No. 1, pp. 79-103, 2006.