Evaluation of Training Effect of Young Cadres Based on AHP Model

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Abstract: Young cadres are the hope for the development of the cause of the party and the state. Under the new situation, the party and the state have put forward new requirements for young cadres, corresponding education and training plans have also been issued, which clarify training objectives and main measures. This study is based on the new requirements for the training of young cadres, the evaluation index is constructed from the Kirkpatrick Model, the weight of each index is designed by using AHP model, and conduct consistency inspection, Scientifically and reasonably evaluate the training effect of young cadres, to provide some reference for optimizing the training program for young cadres.

Keywords: AHP model, Young cadres, Kirkpatrick Model, Training effect evaluation

1. Introduction

Socialism with Chinese characteristics has entered a new era, under the new requirements of high-quality development, young cadres are also playing an increasingly important role. Therefore, building a team of high-quality and professional young cadres is very important to win the great victory of socialism with Chinese characteristics in the new era. Xi Jinping has repeatedly stressed that young cadres are successors and new forces in the cause of the party and the state, young cadres should strive to become a pillar of talent that can be used and shoulder heavy responsibilities, and live up to the expectations and trust of the party and the people.

The training and selection of young cadres is related to the party's cause and the long-term development of the country. Xi Jinping has also put forward requirements and expectations for young cadres in the training courses for young cadres for many times, *2018-2022 National cadre education and training plan* (Hereinafter referred to as *Plan*) points out the direction for what kind of young cadres to cultivate and how to cultivate young cadres. In order to better train young cadres and effectively improve the pertinence and effectiveness of training, It is very important to scientifically evaluate the training effect of young cadres. The existing training effect research mainly focuses on the personnel of enterprises and institutions, considering the particularity and importance of young cadres, this study establishes a training effect evaluation index system for young cadres, which based on the new requirements for the training of young cadres, more scientific and reasonable evaluation of the training effect of young cadres, so as to provide some reference for optimizing the training scheme of young cadres.

2. Design of evaluation index for training effect of young cadres based on Kirkpatrick Model

From a theoretical perspective, the models for training effect evaluation are roughly divided into two categories, as shown in the figure 1 below. One is the model focusing on training effect. The most classic and widely used model in this class is Kirkpatrick Model, on the basis of this model, other models are derived, such as Kaufman's five level evaluation model, Phillips's five level ROI model, etc; the other is the model focusing on the training process, such as CIRO model, CIPP model, etc.

This study focuses on the evaluation of the training effect of young cadres, so the Kirkpatrick Model is selected. Kirkpatrick model mainly includes four levels - reaction layer, learning layer, behavior layer and result layer. Reaction layer is to evaluate the satisfaction of trainees; Learning layer is to measure the degree of learning acquisition of trainees; Behavior layer is to investigate the

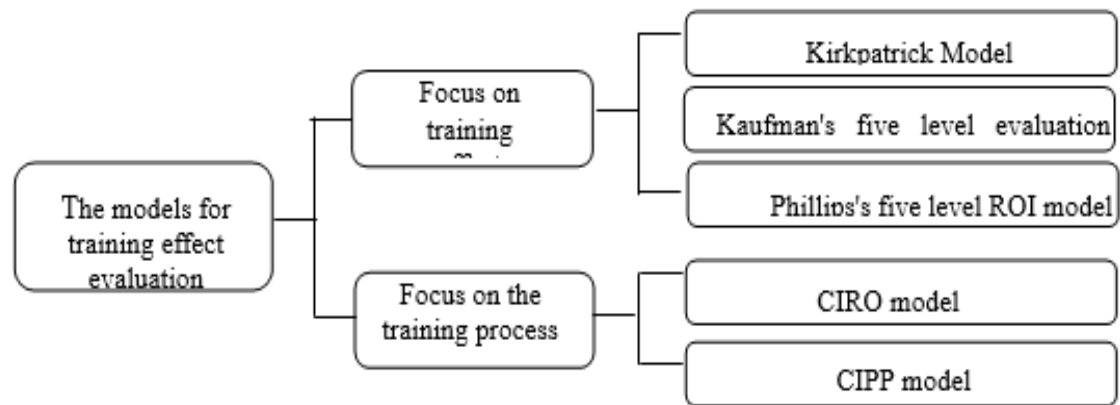knowledge application degree of the trainees; Result layer is to calculate the benefits created by training.

Figure 1: The models for training effect evaluation

In order to more scientifically and reasonably evaluate the training effect of young cadres and improve the pertinence and practicability of the evaluation, When designing evaluation indicators, in addition to the common indicators for evaluating the training effect, some indicators reflecting the new requirements of the party and the state for young cadres should also be added.

Reaction layer - Analyze the training effect based on the trainees' satisfaction with all aspects of training, this layer focuses on the trainees' satisfaction with training. Considering the analysis from the perspective of trainees, three indicators closely related to trainees in the training process are selected, that is, training contents and methods, training teachers and training guarantee. In addition, the completion degree of training planning is also added, which is to broaden the dimension of training effect evaluation and evaluate the training effect from the perspective of training planners.

Learning layer - Analyze the training effect based on the evaluation of the trainees' learning acquisition, this layer focuses on the trainees' learning harvest. On the one hand, young cadres need to have certain general abilities, such as professional ability and management ability, therefore, two indicators of professional skill knowledge and management knowledge are selected; On the other hand, young cadres have certain particularity, *Plan* emphasizes the education of ideals, beliefs and purposes, ideological and moral education and excellent work style education for young cadres, therefore, this study also selects political training1 and ideal, belief and purpose education as the evaluation indicators of the learning layer.

Behavior layer - Analyze the training effect based on the investigation of the trainees' application of the learned knowledge, this layer focuses on the trainees' ability to apply what they have learned. From the role of young cadres, whether they can apply what they have learned is very important, *Plan* clearly stipulates that we should strengthen political training and practical training for young cadres. Based on the new requirements of the party and the state for young cadres, this study selects four indicators as the evaluation indicators of behavior layer: firm belief and loyalty, professional quality, combination of theory and practice, integrity and self-discipline.

Result layer - Analyze the training effect based on calculating the benefits created by training, this layer focuses on the benefits created by the trainees. As successors to the cause of the party and the state, young cadres need to improve their ability through training and better serve the people. Therefore, it is necessary to comprehensively consider internal evaluation and external evaluation, three indicators of public satisfaction, performance appraisal and leadership level are selected as the final evaluation indicators of the result layer.

Based on the above analysis, this study constructs the evaluation index system of the training effect of young cadres, as shown in the figure 2 below.
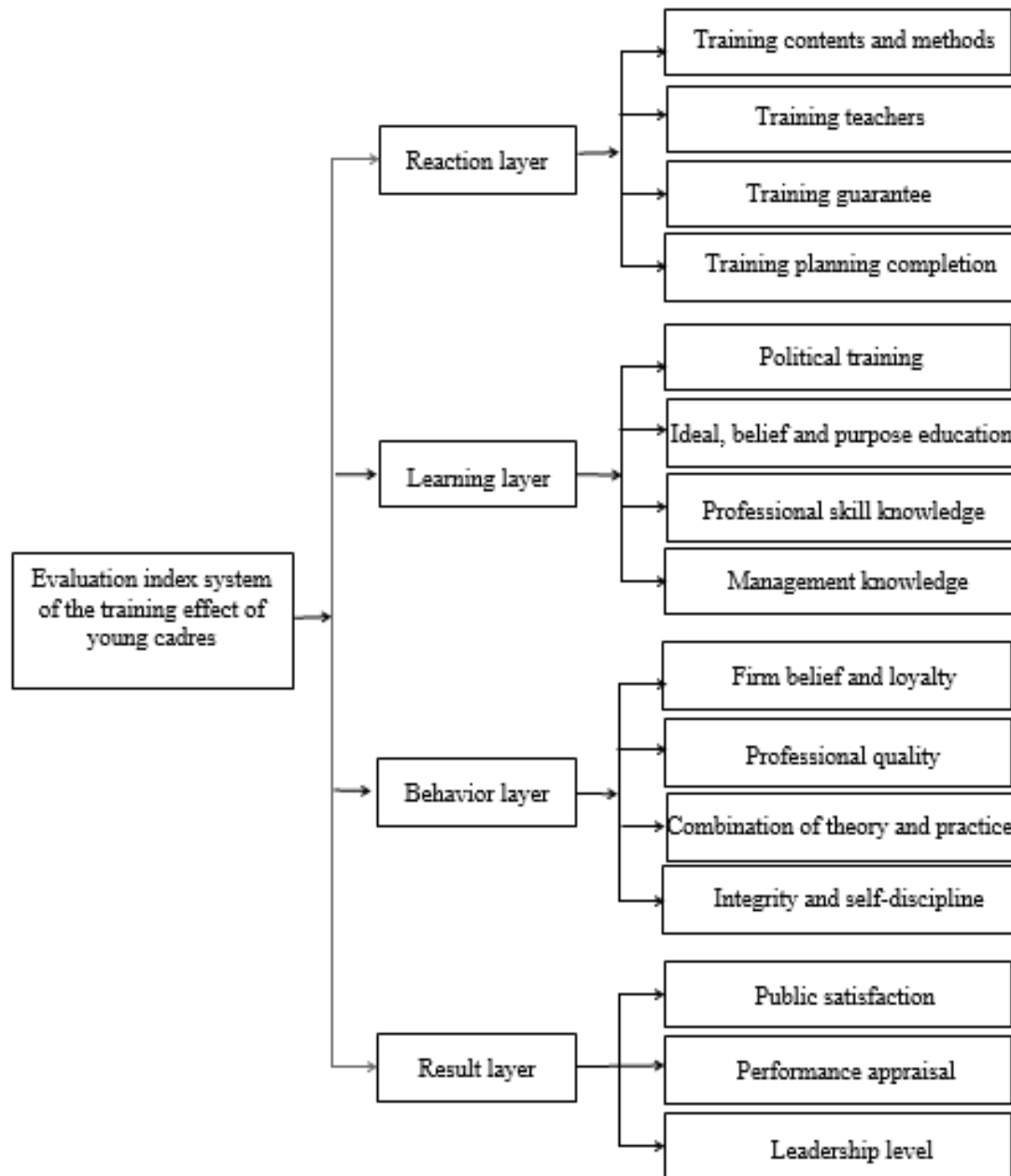
Figure 2: Evaluation index system of the training effect of young cadres

3. Weight determination of evaluation index of training effect of Young Cadres based on AHP model

In this study, the AHP model is used to weight the above-mentioned evaluation indicators of the training effect of young cadres, it mainly includes four steps: First, the hierarchy structure is established, and then the comparison matrix is constructed, then calculate the index weight, and finally test the consistency. Ultimately, a complete evaluation index system for the training effect of young cadres is constructed.

3.1 Establish hierarchy structure

The hierarchy structure in AHP model refers to the structure composed of target layer (one-level index), object layer (two-level index) and index layer (third-level index). This study establishes the corresponding hierarchy structure based on the above-mentioned evaluation index system of young cadre training effect, as shown in the table 1 below.

Table 1: Hierarchy structure of training effect evaluation of young cadres

Target layer (one-level index)	Object layer (two-level index)	Index layer (third-level index)
Evaluation of training effect of young cadres	Reaction layer A_1	Training contents and methods A_{11}
		Training teachers A_{12}
		Training guarantee A_{13}
		Training guarantee A_{14}
	Learning layer A_2	Political training A_{21}
		Ideal, belief and purpose education A_{22}
		Professional skill knowledge A_{23}
		Management knowledge A_{24}
	Behavior layer A_3	Firm belief and loyalty A_{31}
		Professional quality A_{32}
		Combination of theory and practice A_{33}
		Integrity and self-discipline A_{34}
	Result layer A_4	Public satisfaction A_{41}
		Performance appraisal A_{42}
		Leadership level A_{43}

3.2 Build comparison matrix

The construction of comparison matrix refers to the comparison of the relative importance of each factor at a certain level. Building a pairwise comparison matrix to determine its relative importance. The judgment matrix $D = (d_{ij})_{n \times n}$ meets the following characteristics at the same time:

$$d_{ij} = d_i / d_j \tag{1}$$

$$d_{ij} = 1 (i = j) \tag{2}$$

$$d_{ij} = \frac{1}{d_{ji}} \tag{3}$$

29 relevant experts were invited for this study, through the questionnaire, the numerical 1-9 scale method (the specific meaning is shown in the Table. 2 below) is used for investigation and analysis.

Table 2: The numerical 1-9 scale method

1	Indicates that two factors are of equal importance
3	Indicates that compared with one element, another element is slightly important
5	Indicates that compared with one element, another element is significantly important
7	Indicates that compared with one element, another element is strongly important
9	Indicates that compared with one element, another element is extremely important

Note: the importance of 8 is between 7 and 9. Similarly, 2, 4 and 6 are the intermediate judgment values of adjacent scales.

Firstly, this study needs to compare the reaction layer, learning layer, behavior layer and result layer, which belonging to the target layer, to construct judgment matrix; Secondly, it is necessary to compare the four indicators belonging to the reaction layer, to construct judgment matrix......and so on, a total of 5 judgment matrices are involved. After statistical processing of the questionnaire data, five judgment matrices are constructed as follows.

$$D_1 = \begin{bmatrix} 1 & 0.33 & 0.23 & 0.2 \\ 3.07 & 1 & 0.56 & 0.4 \\ 4.28 & 1.77 & 1 & 0.62 \\ 5.11 & 2.48 & 1.62 & 1 \end{bmatrix} \tag{4}$$

$$D_2 = \begin{bmatrix} 1 & 0.30 & 1.2 & 0.6 \\ 3.33 & 1 & 4.55 & 1.82 \\ 0.83 & 0.22 & 1 & 0.51 \\ 1.67 & 0.55 & 1.97 & 1 \end{bmatrix} \tag{5}$$

$$D_3 = \begin{bmatrix} 1 & 0.53 & 2.44 & 1.15 \\ 1.88 & 1 & 3.03 & 1.47 \\ 0.41 & 0.33 & 1 & 0.44 \\ 0.87 & 0.68 & 2.25 & 1 \end{bmatrix}$$

(6)

$$D_4 = \begin{bmatrix} 1 & 1.54 & 1.09 & 0.91 \\ 0.65 & 1 & 0.66 & 0.43 \\ 0.92 & 1.51 & 1 & 0.76 \\ 1.1 & 2.3 & 1.31 & 1 \end{bmatrix}$$

(7)

$$D_5 = \begin{bmatrix} 1 & 0.35 & 0.27 \\ 2.87 & 1 & 0.58 \\ 3.69 & 1.71 & 1 \end{bmatrix}$$

(8)

3.3 Calculate index weight

Considering that the calculation process is basically the same, therefore, this part takes the four indicators of the object layer (two-level index) as an example (i.e. D1), list the calculation process of index weight, and others can be obtained in the same way.

$$D_1 = \begin{bmatrix} 1 & 0.33 & 0.23 & 0.2 \\ 3.07 & 1 & 0.56 & 0.4 \\ 4.28 & 1.77 & 1 & 0.62 \\ 5.11 & 2.48 & 1.62 & 1 \end{bmatrix}$$

Geometrically average the vectors in each row of the judgment matrix D_1, that is, multiply the elements in each row and obtain the root value.

$$W = \sqrt[4]{\prod_{j=1}^{4} d_{ij}}$$

(9)

$$W_1 = \sqrt[4]{1 \times 0.33 \times 0.23 \times 0.2} = 0.35$$

(10)

$$W_2 = \sqrt[4]{3.07 \times 1 \times 0.56 \times 0.4} = 0.91$$

(11)

$$W_3 = \sqrt[4]{4.28 \times 1.77 \times 1 \times 0.62} = 1.47$$

(12)

$$W_4 = \sqrt[4]{5.11 \times 2.48 \times 1.62 \times 1} = 2.13$$

(13)

To weight vector $W = (W_1, W_2, W_3)$ normalization, get the weight of the object layer index, $W_1 = 0.0722, W_2 = 0.1873, W_3 = 0.3028, W4 = 0.4378$.

Combined with the eigenvector, the maximum eigenvalue can be calculated $\lambda_{max} = 4.02$, then, the CI for consistency inspection is calculated by using the maximum eigenvalue λ_{max}.

$$CI = \frac{\lambda_{max} - n}{n - 1} = 0.008$$

(14)

3.4 Consistency test

AHP needs to test the consistency of the judgment matrix, which means using CR as an index to check the consistency of judgment matrix. Generally, the smaller the CR value, the better the

consistency of the judgment matrix. When $n \geq 2$, consistency ratio of judgment matrix $CR = \dfrac{CI}{RI} < 0.1$, that is to say, the judgment matrix meets the consistency test. On the contrary, it indicates that there is no consistency, and the judgment matrix should be adjusted appropriately and analyzed again.

Table 3: Average randomness index

Order number	3	4	5	6	7	8	9	10	11
RI	0.52	0.89	1.12	1.26	1.36	1.41	1.46	1.49	1.52

RI: Average randomness index.

The consistency test of the above judgment matrix shows that:

$$CR = \frac{CI}{RI} = 0.009 < 1 \tag{15}$$

Therefore, it passes the consistency test. That is, the weights of the Object layer indicators are:

$$W_1 = 0.0722, W_2 = 0.1873, W_3 = 0.3028, W4 = 0.4378 \quad .$$

According to the above method, the weight of the overall index system is calculated as shown in the table 4 below.

Table 4: Evaluation index system and weight of training effect of young cadres

Target layer (one-level index)	Object layer (two-level index)	Single weight	Index layer (third-level index)	Single weight	Comprehensive weight
Evaluation of training effect of young cadres	Reaction layer A_1	7.22%	Training contents and methods A_{11}	14.55%	1.05%
			Training teachers A_{12}	48.91%	3.53%
			Training guarantee A_{13}	11.79%	0.85%
			Training guarantee A_{14}	24.75%	1.79%
	Learning layer A_2	18.73%	Political training A_{21}	25.25%	4.73%
			Ideal, belief and purpose education A_{22}	38.90%	7.29%
			Professional skill knowledge A_{23}	11.29%	2.11%
			Management knowledge A_{24}	24.56%	4.60%
	Behavior layer A_3	30.28%	Firm belief and loyalty A_{31}	26.92%	8.15%
			Professional quality A_{32}	15.87%	4.81%
			Combination of theory and practice A_{33}	24.54%	7.43%
			Integrity and self-discipline A_{34}	32.67%	9.89%
	Result layer A_4	43.78%	Public satisfaction A_{41}	13.06%	5.72%
			Performance appraisal A_{42}	33.97%	14.87%
			Leadership level A_{43}	52.97%	23.19%

4. Conclusion

Young cadres are the hope of the development of the cause of the party and the state. Therefore, how to effectively train young cadres is very important, scientific evaluation is the basis for improving training efficiency. This study focuses on young cadres, from the perspective of scientific evaluation of the training effect of young cadres, in order to improve the pertinence and effectiveness of training through scientific and reasonable evaluation of the training effect. Sort out the new requirements put forward by the party and the state for the training of young cadres, based on the four layers of Coriolis model - reaction layer, learning layer, behavior layer and result layer, to select the evaluation index of training effect of young cadres, on this basis, the evaluation index system of training effect of young cadres is established by using AHP model.

With the continuous development of society, the training objectives and training paths for young cadres will become clearer and clearer, how to scientifically carry out relevant training is an important issue, scientific and reasonable evaluation of training effect can maximize the effectiveness of training, it is hoped that this study can provide some reference for the follow-up training of young cadres.

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