



Big Data Analysis of Chinese Postgraduate Scholarship Evaluation Policy Based on SPSS Software Statistics

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Abstract. Based on the CIPP model, this paper constructs an analysis model of Chinese postgraduate scholarship evaluation policy from four dimensions of Context evaluation, Input evaluation, Process evaluation and Produce evaluation. In policy background, we use questionnaires and SPSS to survey three representative universities in H Province. The study found that in the Context evaluation, above 70% of samples think the policy's purpose pays more attention to scientific research. In the Input evaluation, the evaluation rules are homogenized seriously, the quantitative evaluation dominates. In the Process evaluation, the qualitative method and students' voices are lacking even only 3%. In the Produce evaluation, more than 80% of student relationships are negatively affected by result announcements. So, the evaluation system should be more scientific.

Keywords: CIPP model · postgraduate · scholarship policy

1 Introduction

There are significant national scholarships and academic scholarships for academic postgraduates in China. Both of them consist off our levels: “country-province-university-institute.” Based on the national policies, “The notice on the Interim Measures for the administration of national scholarships for postgraduate (September 29, 2012)” and “The Interim Measures for the administration of academic scholarships for postgraduate (July 29, 2013)”, each province has formulated its policies. According to the provincial notice, the colleges and universities develop the scholarship management measures with their actual situation. At present, the scholarship policy system has formed the characteristic of “the two ends are solid and the middle is empty,” which has aroused a significant effect on the graduate students.

The CIPP assessment model is widely applicable and has been updated and successfully applied in many countries and across a wide range of disciplines and services due to its reliability, versatility and practicality. In this study, the CIPP evaluation model was introduced to analyze the current situation of scholarship policy, and to examine the implementation status of scholarship policy from the perspectives of Context evaluation, Input evaluation, Process evaluation and Produce evaluation, which has important breakthrough value for the problems in the evaluation policy of graduate scholarship.

2 Theoretical Analysis Model and Data Selection of Research

2.1 Theoretical Analysis Framework of the CIPP Evaluation Model

Stufflebeam closely combines evaluation with decision making, and organically combines diagnostic evaluation, formative evaluation and summarized evaluation, construct CIPP evaluation model including Context evaluation, Input evaluation, Process evaluation and Produce evaluation (Stufflebeam and Zhang 2017). The starting point of the evaluation of postgraduate scholarships in China is to improve the quality of postgraduate education and develop postgraduate education with Chinese characteristics. CIPP evaluation model is based on the organic combination of diagnostic evaluation, formative evaluation and summarized evaluation, highlighting the function of diagnosis and development of diagnostic evaluation. Its purpose is not to evaluate the quality of the results, but to improve the service for decision makers. “Not to prove but to promote” is the common philosophy of both. Therefore, this study makes a statistical analysis of the evaluation system of postgraduate scholarships in China from four aspects: Context evaluation, Input evaluation, process evaluation and Produce evaluation. The policy purpose of the systematic analysis and assessment system in Context evaluation; the Input evaluation takes into account the rules and methods for conducting the scholarship; Process evaluation examines the fairness of the evaluation process; the Produce evaluation focuses on the educational effect of the scholarship. Following the theory, the analysis model as shown in Fig. 1 is constructed.

2.2 Research Object and Data Source

The paper takes three universities named A, B and C as research objects in Chinese H Province. Classify the three universities according to the scope of disciplines, A is a normal university, B is a comprehensive university, and C is a university of science and technology. They are different types, but all provincial government-owned to ensure

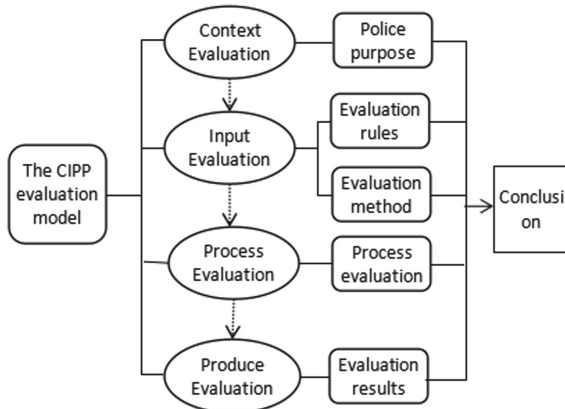


Fig. 1. Theoretical Analysis Model of Chinese Graduate Scholarship evaluation Policy Based on CIPP model

representative and comparability. The textual analysis of the scholarship evaluation system and student cluster sampling survey were carried out for the colleges with dominant disciplines in the three universities. At last the survey gets 117 samples, including 39 in A, 41 in B, and 37 in C.

2.3 Questionnaire Survey

The questionnaire was designed based on the CIPP assessment model and the literature review. It consists of two parts: the basic information about students and evaluates implementation of the scholarship policy. The questionnaire is divided into four dimensions, Context evaluation includes policy background and student background; Input evaluation includes evaluation rules and methods; Process evaluation includes scholarship evaluation procedures; Produce evaluation focuses on outcome promotion and interpersonal impact. Through the questionnaire survey of students in three universities, this paper analyzes the problems in the implementation of China's postgraduate scholarship evaluation system, and analyzes the impact of the scholarship policy operation combined with the actual situation.

3 Date Analysis Results

3.1 Questionnaire Analysis Results

The questionnaire validity is higher, the measurement results which show the attributes are more. Commonly, the validity is good when the Kaiser-Meyer-Olkin (KMO) is more than 0.7 and the Significance of the Bartlett's spherical test (Sig.) is less than 0.05. The KMO is 0.747 and the Sig. is 0 of this questionnaire (see Table 1).

3.2 Coding Results of Policy Analysis

First, coding the policy text data of three universities sentence by sentence into open coding and get 114 primary codes from 208 original sentences. Second, cluster analysis is carried out on the categories and genera formed in the open coding to establish the relationship between the discourse in the data, further spindle coding is carried out to establish the relationship between relativistic independent concepts in open coding. After that, two main categories and five categories are obtained. Finally, selective coding, also

Table 1. KMO and Bartlett test

KMO sampling suitability quantity		
0.747		
Bartlett's spherical test		
Chi-square	Degrees of freedom	Significance
286.460	36	0.000

known as core coding, after the systematic Analysis of all conceptual genera of the data, the “core genera” with relevance and conceptually are selected to command other categories, to form a general formal theory.

4 The Problem of Chinese Graduate Student Scholarship Evaluation Policy

4.1 Context Evaluation: “Center on Scientific Research”

Based on CIPP model, the conflict between student background and policy background was found in the Context evaluation, which is reflected in the imbalance between policy objectives and some postgraduate career planning. The evaluation purpose of the policy pays attention to the scientific research ability and achievements of academic graduate students, but lack of the consideration to students who engage in career planning.

According to policy text, the three colleges and universities have set detailed rules for the evaluation of specific scholarships, and scientific research projects account for the highest proportion. University A does not specify the ratio of scientific research projects, but only 10 points of moral education evaluation are given in the conditions for participating in the assessment, and the remaining points belong to scientific research projects. B University only pays attention to academic record and achievements of scientific research projects, University B only focuses on academic achievements and scientific research achievements, and the two account for 50% respectively, the moral and social practice has not received attention. C University scholarship evaluation project is divided into seven parts: academic papers, patents, academic exchanges, science and technology competitions, CET-6, social practice and ideological and moral character. The latter three also account for a small proportion of scores. The establishment of the postgraduate scholarship policy of colleges and universities aims to enhance the educational value of students as the value orientation. However, in the actual investigation process, the students of the three colleges and universities will not continue to engage in scientific research when choosing whether to continue to engage in relevant work related to scientific research in the future (see Table 2). Above 70% of samples think the will not engage in work related to scientific research.

Table 2. Development choice of academic postgraduate

Name of institution/Development selection	Select work related to scientific research	Will not engage in work related to scientific research	Total
B University	11 (26.83%)	30 (73.17%)	41
C University	10 (27.03%)	27 (72.97%)	37
A University	4 (10.26%)	35 (89.74%)	39

Therefore, if the evaluation perspective of graduate scholarship policy is based on a single academic view rather than others related capabilities, the scholarship policy of academic postgraduate will lack of diversified, dynamic and can not form an ecological pattern of coordinated development in many aspects (Sheng and Cao 2020).

4.2 Input Evaluation: Consideration of Evaluation Rules and Methods

4.2.1 Evaluation Rules “Center on Unity”

The unity of rule making in input evaluation dimension is prominent and lacks pertinence. In the formulation of postgraduate scholarship evaluation policies, the three types of universities have obvious concept of “center on unity”, serious tendency of homogenization, weak concept of classification evaluation, and neglect the particularity of discipline types and the difference in the number of students.

The scholarship policies of the three universities are strongly unified, and there is no noticeable difference in the specific scholarship evaluation rules between universities of science and technology and regular universities, (see in Table 3). The general measures of setting the evaluation policy of graduate scholarships in different disciplines are not targeted. Taking science and engineering for example, the articles of science are more manageable to publish than those of engineering, and the influence factors of engineering journals are not high. If we do not adopt the classified evaluation system and blindly take factors such as SCI or core papers as the evaluation criteria, the fairness needs to be considered, which will also hurt the psychology of graduate students. Colleges and evaluation standards. The evaluation indicators of different colleges and universities are consistent, and there is no division of classified evaluation. Policies among disciplines pay attention to establishing specific digital indicators, ignoring the quality connotation of scholarship evaluation, and replacing “quality” with “quantity”.

Under the monopoly of scientific research and intellectual capital, the scholarship evaluation of postgraduate is simplified into calculable, predictable, and controllable paper production. Different types of research complete tasks according to unified standards and participate in the scholarship evaluation. The phenomenon of “McDonald’s of higher education” is common (Zhang and Hu 2021), which has a negative effect on the improvement of the overall education quality of postgraduate.

Table 3. Rule of scholarship core word statistical analysis

Name of institution/Core word type	Academic record	Achievements in scientific research	Ideology and morality
B University	50%	50%	0%
C University	10%	65%	15%
A University	0%	75%	15%

Table 4. Analysis of the specific proportion of the scholarship evaluation index

Name of institution/Type of evaluation index	Academic record	Achievements in scientific research	Ideology and morality
B University	6(20%)	16(53.3%)	7(23.3%)
C University	4(15.4%)	14(53.8%)	5(19.2%)
A University	2(7.4%)	15(55.6%)	5(18.5%)

4.2.2 Evaluation Method “Center on Quantitative”

Based on the evaluation method dimension in the input evaluation, the evaluation criteria for analyzing the graduate scholarships of the three universities are mainly quantitative criteria to define the proportion and score of academic performance, as shown in Table 4. The final score is a vital measurement standard for evaluating scholarships, and the weight proportion of students’ ideological and moral character and practical ability is low. Under the paradigm of natural science research, the evaluation scheme following the spirit of scientism has been highly praised. With the advent of artificial intelligence, the idea of “computational doctrine” has eroded all aspects of the evaluation field. The division of the detailed rules of the university graduate scholarship evaluation policy is the product of calculation and attention in the field of modern higher education evaluation. Colleges and universities pursue formal logic, quantify the specific detailed rules of scholarship evaluation into accurate digital indicators. Students regard the materials participating in scholarship evaluation as objective and controllable objects. The corresponding visual output results are also obtained through their input.

In the computational evaluation model, to meet the benefits of decision managers’ and stakeholders’ mastery of accurate new measurement, this model is shown as a simple measurement index and measures the final results. The detailed rules for the formulation of scholarship evaluation policies of the three universities focus on academic achievements, ignoring the apparent characteristics of students’ process evaluation. Only the scholarship evaluation policy of University C involves scoring the ideological and political aspects of participating graduate students for one year, but the criteria and methods for specific consideration are uncertain, the other two universities are less involved in the process evaluation of students and lack the participation of portfolio evaluation.

4.3 Process Evaluation: Operating Procedures “Center on Teachers”

From the perspective of process evaluation, in the process of graduate scholarship evaluation, the transparency of personnel selection, evaluation materials, and results of graduate students participating in the evaluation process is not high, which affects students’ satisfaction with scholarship evaluation. In the formulation of the graduate scholarship policy of the three universities, the composition of the scholarship evaluation committee is composed of student members. The proportion of student members is still low. The graduate students of University B can actively apply to participate in the graduate

Table 5. Student participation in the evaluation process

Name of institution/Student participation	Teachers dominate the procedure, and students have few opportunities to participate.	Students have opportunities to participate overall process and supervise the fairness of evaluation	Total
B University	20 (48.78%)	21 (51.22%)	41
C University	26 (70.27%)	11 (29.73%)	37
A University	36 (92.31%)	3 (7.69%)	39

scholarship evaluation process, and only the student representatives of University A and University C can participate.

Through the in-depth investigation of students, it is found that the representation of student members is not strong. They are generally composed of student cadres, and the number is only one or two. It is difficult for most graduate students to participate in the scholarship evaluation process to audit, as in Table 5 Few students participate in the scholarship evaluation process, on the one hand, it will affect students’ understanding of policies and their management participate right. On the other hand, it also weakens the function of students who study hard or scientific research excellent as examples (Fan and Liu 2019), because the students can not understand their partners’ achievements who participate.

4.4 Produce Evaluation: Evaluation Results “Center on the Announcement”

CIPP model emphasizes the consideration of positive and negative outcomes, unintended outcomes and other aspects, but the results of the scholarship are displayed in the form of an announcement without considering the chain effect of evaluation. The most common chain effect is that the interpersonal relationship between students is severely affected. The information is a one-way notice, lack of necessary communication, failed students did not get a clear explanation, so often will be destructive emotions projected on the selected students. Through the survey of students in three universities, it is found that 95% of students in University A, 85% of students in University B, and 81% of students in University C have affected the relationship between students in the process of scholarship evaluation, as Table 6.

Graduate students are a high incidence group of psychological problems (Zhao and Wang 2021). The announcement-type results lead the conflict between students and college, students and teachers, students and students. Students in the three universities show that their college has not done relevant ideological education on scholarship evaluation. Tutors give little guidance in words. Their problems should be predicted and prepared during the process of evaluation so that construct postgraduate psychology and improve the training quality.

Table 6. Impact of scholarship evaluation on student' interpersonal relationship

Name of institution/The degree of interpersonal relationship influence	I learned that other students had conflicts because of the scholarship evaluation.	Because I participated in the scholarship, I affected the friendship between my classmates.	Scholarship evaluation will not affect interpersonal relationships
B University	25 (60.98%)	10 (24.39%)	6 (14.63%)
C University	21 (56.76%)	9 (24.32%)	7 (18.92%)
A University	21 (53.85%)	16 (41.03%)	2 (5.13%)

5 Conclusions

The purpose of CIPP model is not to evaluate the quality of the results, but to improve the service for decision makers. Based on the CIPP model, this paper finds that there are three problems in China postgraduate scholarship evaluation policy from the perspectives of Context evaluation, Input evaluation, Process evaluation and Produce evaluation. First, it is out of balance between the evaluation effect and some academic postgraduate career planning in purpose. Second, the specific implementation rules are not targeted. Third, the quantitative requirements of evaluation standards are more prominent than qualitative. It was evident that the operating procedures are opaque, and the publicity of implementation results ignores the tail effect among students. Through statistical analysis of the evaluation policy of postgraduate scholarships in China, this paper aims to establish a scientific evaluation policy and promote the improvement of postgraduate education.

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