

Construction and Application of Internal Control System of Scientific Research Funds Management in Colleges and Universities from the Perspective of Information

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Abstract: At present, the management of SR funds in colleges and universities(CAU) is not standardized, and there are some problems, such as serious property losses, difficult cost accounting of scientific research(SR) projects, low efficiency of SR funds, and low degree of industrialization of SR achievements. In view of these problems, this paper puts forward some countermeasures to strengthen the management of SR funds in CAU. This paper studies financial accounting and financial management, and points out budget management, SR funds, professional quality of accountants and other issues. This paper analyzes the new changes, new ideas and new challenges of university library management system and mechanism. This paper studies the problems of complex factors and low management rate in the management of SR funds in CAU. Based on Fuzzy Analytic Hierarchy Process (FAHP), this paper designs the index system including management, environment, personnel and technology, and establishes the risk evaluation model of SR funds management in CAU. The results show that the total research funds of K university are 8.303 million yuan in 2017, 11.24 million yuan in 2018 and 15.42 million yuan in 2019. The research funds of K university are increasing year by year.

1. Introduction

SR funds management is an important part of SR management and one of the important basic guarantees of SR. At present, there are some misunderstandings in the management of SR funds in the humanistic society of CAU, such as the defects of SR budget table and SR project reimbursement table in the system, and the low degree of informatization in the management of SR funds. Many problems in the management of SR funds have become a major problem in SR management. It is necessary to strengthen the management of SR funds in CAU, further strengthen the management of SR funds, improve the management system of SR funds, strengthen the supervision of SR projects, and improve the fund management level of SR informatization construction.

With the increase of national SR funds, funds management is also facing more and more pressure. Many experts have studied the SR funds in CAU, and analyzed the problems existing in the management of SR funds in CAU. It emphasizes the necessity of strengthening management in the new period. This paper puts forward some reasonable suggestions on improving the institutional environment of SR funds management, standardizing the balance of funds management, and improving the transparency and efficiency of SR funds. According to the new ideas and new situation, this paper puts forward the problems existing in the management of SR funds from the perspective of audit, including: lack of comprehensive and sound mechanism management; poor implementation and management of SR funds management; imperfect performance evaluation mechanism of SR funds management and its impact on enterprises; comprehensive evaluation of SR funds management. This paper expounds the significance of establishing the indirect cost compensation mechanism of science and technology funds. In view of the problems existing in the management of SR funds in CAU, this paper puts forward specific optimization measures, and establishes a management mechanism based on trust and humanistic value under the new situation, so as to make the management mechanism more adapt to the new situation of reform. Some experts

have studied the performance evaluation of SR funds management in CAU, and put forward corresponding countermeasures from the guiding ideology, management system, operation mechanism and other aspects. In order to further deepen the reform of relevant government departments and improve the policy and system of SR funds management in CAU, this paper deeply analyzes the problems and reasons existing in the national policy of SR funds management, puts forward the standardization of indirect cost management, and probes into the management of SR funds under the background of audit from various angles, so as to improve the use efficiency of SR funds. This paper introduces the research background and significance of management in China, lists a series of research methods used in the research, and comprehensively expounds the research content. With the help of the research conclusions of some experts and scholars at home and abroad, it provides a theoretical basis for the research of this paper, and clearly expounds its advantages and disadvantages. This paper expounds the concept definition and theoretical basis of SR funds management, studies and discusses different theories, and systematically analyzes the current performance evaluation index system. Using the film analysis method and questionnaire survey method to accurately estimate and calculate the weight of each index, and then using the fuzzy comprehensive evaluation method to analyze various problems existing in the management of SR funds, and put forward the corresponding solutions [2]. Some experts put forward pi system management mode by integrating relevant materials, reading foreign literature and referring to the existing management mode. This paper analyzes and discusses how to promote the project to effectively regulate SR behavior, improve SR efficiency and improve SR achievements. This paper analyzes the problems existing in the management and use of SR funds in CAU, and puts forward some suggestions. This paper introduces the problems existing in the management of SR funds in CAU, analyzes from the aspects of budget, funds management, fixed assets management, funds balance management, etc., puts forward some solutions, and puts forward some reasonable suggestions for strengthening the management of SR funds [3]. From the perspective of informatization, the construction and application of internal control system of SR funds management is quite rich, but there are still some shortcomings.

In order to study the construction and application of the internal control system of SR funds management from the perspective of informatization, this paper studies the management of SR funds in CAU, and finds that the fuzzy comprehensive evaluation results show that informatization is conducive to the construction and application of SR funds management system in CAU.

2. Method

2.1 Sr Funds Management

(1) SR funds

SR funds generally refer to various expenses for the development of science and technology [4]. The SR funds of CAU are generally provided by the units where the projects are located, and are stipulated to be used within the scope of special funds [5]. Usually, from the beginning to the end of the project, there will be the expenditure of SR funds, including all the direct and indirect costs related to the project [6]. Project direct cost refers to the cost in the process of SR, such as the purchase of SR equipment, fixed assets related to SR, new product design, test and evaluation [7]. The indirect expenses of this project include the communication expenses, conference expenses, travel expenses, etc. related to the SR project. The indirect cost also includes the management cost of the school [9]. SR funding is an important guarantee for universities to carry out SR. Generally speaking, the allocation of funds is decided by the government, non-governmental organizations, enterprises, foundations and other project sponsors [10]. After the project content is determined, the project sponsor allocates research funds by entrusting or selecting universities, which not only reflects the support of the country or region for scientific and technological research and innovation, but also reflects the scientific and technological ability of universities [11].

(2) Fund management

Only in the process of reform can we find the most suitable mode and method for the

management of SR funds in higher vocational colleges, and can we better serve CAU. Pay attention to the reform and innovation of management mode, not only pay attention to the method innovation of policies and regulations, but also pay attention to the innovation of operation and SR. In the process of effective SR management, we should reform the existing policies and systems. The most important thing is to master the practical operation and scientific management mode of SR. Only in this way can we find new methods on the basis of existing methods. Management system reform is the most important soul of the whole management system. SR funds management is the whole process of a system, involving the government and relevant departments of CAU, SR personnel and enterprises and institutions. Therefore, in order to adhere to the consciousness of overall consideration, we must make overall arrangements for management, clarify the division of labor, strengthen information communication through the establishment of an information platform, coordinate the relationship between various subjects and procedures, ensure the maximization of benefits, and avoid the phenomenon of decentralization and independence.

2.2 Fuzzy Comprehensive Evaluation

According to the estimated value and membership relationship of each index, all the weight vectors obtained are multiplied by the corresponding membership matrix to calculate the membership vector in the superstructure corresponding to each index in the whole hierarchy. It is shown in formula (1):

$$B = W \times R = \begin{Bmatrix} r_{11} & r_{12} & \dots & r_{1n} \\ r_{21} & r_{22} & \dots & r_{2n} \\ \dots & \dots & \dots & \dots \\ r_{m1} & r_{m2} & \dots & r_{mn} \end{Bmatrix} \quad (1)$$

On the basis of the questionnaire information, follow-up performance analysis. Firstly, a row vector is constructed, and the contents of the vector at different levels such as “poor”, “medium”, “good” and “excellent” are defined, and V is used to represent the level vector, as shown in equation (2):

$$V = (V_1, V_2, V_3, V_4) \quad (2)$$

To some extent, the biggest advantage of this method is quantitative transformation, quantitative series of text comments. Given a column vector, the value of V is (10, 15, 20, 25). Among them, 0-10 is poor, 10-15 is medium, 15-20 is good and 20-25 is excellent. In addition, four established indexes are used to design evaluation factors, as shown in equation (3):

$$R = (R_1, R_2, R_3, R_4) \quad (3)$$

Finally, a membership relation vector is obtained to evaluate the effectiveness of scientific management of target level indicators. By multiplying the target level vector by the above vector, the result D of SR fund management performance evaluation is calculated and compared with the above indicators, as shown in formula (4):

$$D = \{10, 15, 20, 25\}^T \times \{R_1, R_2, R_3, R_4\} \quad (4)$$

3. Experience

3.1 Experimental Object Extraction

For all SR projects, we should do a good job in budget arrangement, and the budget arrangement of SR funds should be able to reflect the real situation of funds. The basis of all this is reasonable budget arrangement. In the actual fund management, the final accounts should be made in strict accordance with the budget arrangement and the actual consumption of funds. Budget, management and final accounts are closely linked. In the process of completing the whole SR project, only by strictly following these three steps can the SR funds be effectively managed. Therefore, to truly reflect the financial situation of CAU, we need to have a sound and reasonable budget management

system. At the same time, we should timely adjust the unreasonable system, improve the fund management system, achieve high efficiency and precision, and ensure that the budget process is reasonable and standardized.

3.2 Experimental Analysis

In order to ensure the scientific and reasonable SR budget, it is suggested that the SR team, management department and financial department should participate in the preparation of SR budget. First, from a professional point of view, the SR team carries out a preliminary calculation of the use of SR funds at different stages according to the SR purpose and relevant experience; second, from a professional point of view, it carries out a preliminary calculation of the use of SR funds. The management department and financial department, in addition to the SR team, management department and financial department, strictly follow the national regulations and school regulations, from the perspective of funds management financial departments and universities should also set up audit departments to supervise the use of research funds and avoid the abuse of funds. Different departments in CAU put forward suggestions on the use of SR funds from different angles, and improve the use, management and supervision mechanism. Before using the SR funds, the SR team needs to start the plan of using the SR funds, which must be approved by the relevant person in charge to ensure the reasonable use of the funds from the source.

4. Discussion

4.1 Sources of Sr Funds in Cau

Like other universities, the sources of SR funds of K universities are mainly divided into two categories: vertical research funds and horizontal research funds. The vertical funding of K university mainly comes from the government, and the vertical projects are basically the research projects directly funded by the government, as well as the research projects of provincial and municipal governments. Among all the approved research funds of K University, government funds still occupy the main position. Horizontal research funding refers to the research funding obtained by the school from enterprises and institutions outside the school. In addition to the vertical fund and horizontal fund, K university has also set up on campus SR fund, which is mainly used for the research and development of excellent disciplines on campus. Its source is not from outside school, but also from the scope of self financing. Therefore, it does not involve the research on the internal funds of K University. As shown in Table 1.

Table 1 a Summary Of the Allocation of Sr Funds in Cau

particular year	Vertical funding (10000 yuan)	Horizontal funds (10000 yuan)	Total research funds(10000 yuan)
2017	356.6	473.7	830.3
2018	489.5	634.5	1124
2019	864.4	675.8	1540.2

It can be seen from the above that the vertical funds of K University in 2017 are 3.566 million yuan and the horizontal funds are 4.737 million yuan; the vertical funds of K University in 2018 are 4.895 million yuan and the horizontal funds are 6.345 million yuan; the vertical funds of K University in 2019 are 8.644 million yuan and the horizontal funds are 6.758 million yuan. The results are shown in Figure 1.

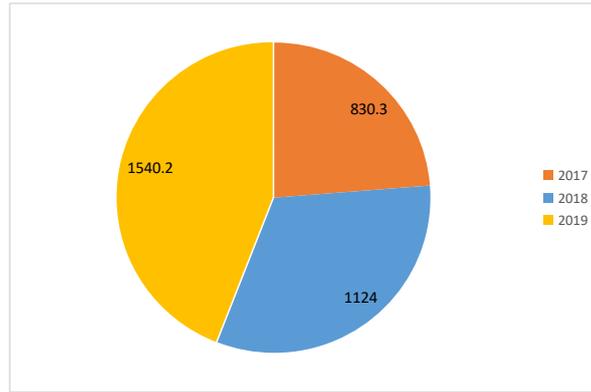


Fig.1 A Summary of the Allocation of Sr Funds in Cau

It can be seen from the above that the total research funding of K University in 2017 is 8.303 million yuan, that in 2018 is 11.24 million yuan, and that in 2019 is 15.42 million yuan. The SR funds of K University increase with the year.

4.2 Descriptive Statistical Analysis

The person in charge of a SR project that has been approved may be trained in batches. After the training, a special person in charge of the SR project may be designated. This paper makes descriptive statistical analysis on the four variables of information collaboration, audit supervision, management system satisfaction and SR output, and analyzes the mean value, standard deviation and other descriptive indicators of each variable. The specific results are shown in Table 2.

Table 1 Descriptive Statistical Analysis of Variables

	Information collaboration	audit supervision	Management system satisfaction	Output of SR achievements
average value	2.824	3.474	7.456	3.647
standard deviation	3.673	4.744	5.733	6.573
skewness	6.837	5.844	6.783	5.438

From the above, we can see that the average value of information collaboration is 2.824, the standard deviation is 3.673, and the skewness is 6.837; the average value of audit supervision is 3.474, the standard deviation is 4.744, and the skewness is 5.844; the average value of management system satisfaction is 7.456, the standard deviation is 5.733, and the skewness is 6.783; the average value of SR output is 3.647, the standard deviation is 6.573, and the skewness is 5.438. The results are shown in Figure 2.

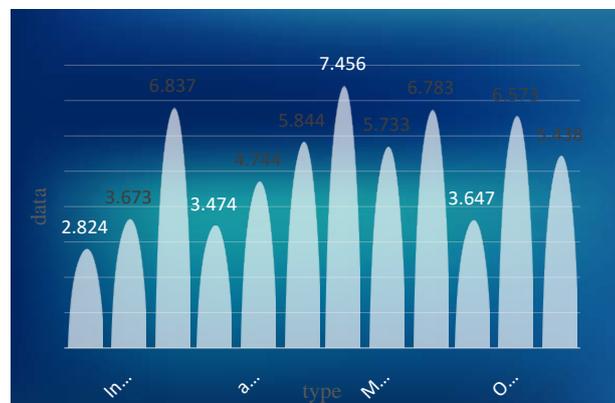


Fig.2 Descriptive Statistical Analysis of Variables

It can be seen from the above that the maximum deviation of information collaboration is 6.837, the maximum deviation of audit supervision is 5.844, the maximum average value of management system satisfaction is 7.456, and the maximum standard deviation of SR output is 6.573.

5. Conclusion

In order to establish and improve the management responsibility system, increase publicity, improve the correct understanding of the strict SR funding system for SRers, strengthen the management of SR funding in CAU, and strengthen the monitoring and evaluation of SR funding. It is helpful to establish a scientific and effective fund management mechanism, make the best use of funds, analyze the main problems existing in fund management, and put forward the corresponding countermeasures. We should standardize the management system of SR funds, build a scientific evaluation system, improve the ability of audit team, establish a scientific and technological information platform, and learn from foreign experience to ensure the healthy and fair development of SR in CAU. Based on the analysis of the changes in the management system of SR funds in China and the problems encountered in the financing of SR funds in CAU, this paper puts forward some measures, such as strengthening the management foundation, making a reasonable budget, and changing the responsibility, etc., so as to transform the extensive management to the intensive management. The university has formulated the total amount management system and refined management methods, so as to strengthen the management of SR funds and promote the development of SR in CAU in China.

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References

- [1] Ballantine J A , Guo X , Larres P . Can Future Managers and Business Executives be Influenced to Behave more Ethically in the Workplace? The Impact of Approaches to Learning on Business Students' Cheating Behavior[J]. *Journal of Business Ethics*, 2018, 149(1):245-258.
- [2] Christina, E, Mitchell. Internal Locus of Control for Expectation, Perception and Management of Answered Prayer:[J]. *Journal of Psychology and Theology*, 2018, 17(1):21-26.
- [3] Wang Y . The Impact of Controlling Shareholder Equity Pledge on Stock Price Fluctuation[J]. *World SR Journal*, 2020, 6(2):110-123.
- [4] Lapchak P A , Zhang J H . Data Standardization and Quality Management[J]. *Translational Stroke Research*, 2017, 9(7):1-5.
- [5] Ibikunle G , Steffen T . European Green Mutual Fund Performance: A Comparative Analysis with their Conventional and Black Peers[J]. *Journal of Business Ethics*, 2017, 145(2):337-355.
- [6] Waldo S , Paulrud A . Reducing Greenhouse Gas Emissions in Fisheries: The Case of Multiple Regulatory Instruments in Sweden[J]. *Environmental & Resource Economics*, 2017, 68(2):1-21.
- [7] Khvatova T , Dushina S . To manage or govern? Researching the legitimacy of NPM-based institutional reforms in Russian universities[J]. *Journal of Management Development*, 2017, 36(2):250-267.
- [8] Butz C , Liechti J , Bodin J , et al. Towards defining an environmental investment universe within planetary boundaries[J]. *Sustainability science : official journal of the Integrated Research System for Sustainability Science*, 2018, 13(4):1031-1044.
- [9] Li W , Song Y . Managing moral risks in medical insurance from the perspective of development of medical informatization[J]. *Финансы и управление*, 2020(2):1-11.
- [10] Liu Z . The development of enterprise informatization management system from the perspective of big data[J]. *Revista de la Facultad de Ingenieria*, 2017, 32(13):483-489.

[11] Huang Q . Research on the Hybrid Teaching Reform of Online Open Course Three-Dimensional Classroom[J]. International Journal of Social Science and Education Research, 2019, 2(9):55-61.