



Research on University Education Cost Accounting Under the Background of Big Data Based on the Perspective of the Operation Cost Method

Huiyun Zhang^(✉)

Shandong Normal University, NO88, Lixia District, Jinan 250000, Shandong, China
379899129@qq.com

Abstract. With the development of digital technology and artificial intelligence, the era of big data has arrived. In the background of big data, data is highly shared and integrated, which provides a guarantee for using the operation cost method to accurately calculate the cost of university education. Taking S university as an example, this paper first analyzes the feasibility of accounting of education cost in universities under the background of big data, and then the process of using operation cost method is constructed. Finally, relevant suggestions are put forward from the two aspects of improving the professional level of accountant and strengthening the information construction to ensure the smooth implementation of the operation cost method under the background of big data.

Keywords: Big data · Education Cost · Operation Cost Method

1 Foreword

At present, colleges and universities usually use the traditional statistical method for education cost accounting to calculate the training cost per student, and the cost accuracy of the accounting is not high [1]. However, the majority of scholars tend to use the operation cost method to calculate the cost of university education, but in practice, the implementation of the operation cost method faces great challenges due to the difficulty in data acquisition, large workload and other reasons. At the same time, with the development of digital technology and artificial intelligence, the era of big data has arrived. In the background of big data, data is highly shared and integrated, which provides a guarantee for the accurate accounting of university education cost by the use of operation cost method. Taking S university as an example, this paper will analyze the accounting of university education cost under the background of big data.

2 Feasibility Analysis of Operation Cost Method for Accounting of Education Cost in the Background of Big Data

S university is established in a provincial capital city of a province. S universities cover ten disciplines, with different majors and levels, more operation activities, less direct costs that can be directly included in the cost of university education, and more indirect

costs, which is suitable for the application of operation cost method. Under the operation cost method, the allocation of indirect costs to take closely related to the cost of college education activities as distribution standard, improve the accuracy of the indirect cost allocation, can reflect the education cost of universities, but because the data acquisition involves multiple departments, complex calculation, using the operation cost method accounting faces great difficulties. However, in the background of big data, data mining, machine learning and artificial intelligence technologies can be used to collect, collate and store education cost data, identify the regular characteristics, and generate data with significant value, so as to improve the accurate accounting of education cost.

3 The Process of Colleges and Universities Using the Operation Cost Method to Calculate Education Costs Under the Background of Big Data

3.1 Determine the Scope of Education Cost Accounting

Cost is the targeted cost. This paper takes the students of different educational levels trained in various colleges of S universities as an example to analyze the cost of education.

3.2 Identifying Resource Projects

Resources is the source of operation consumption, according to the economic content can be divided into human resources, material resources and capital resources [2], S university and education cost accounting related economic classification course is divided into five categories, respectively for salary welfare expenditure, goods and services, subsidies for individual and family spending, depreciation of fixed assets, amortization of intangible assets. Human resources are mainly wage and welfare expenses, subsidies for individuals and families; material resources are mainly commodity services expenses; capital resources are mainly depreciation expenses of fixed assets and amortization expenses of intangible assets.

Resources according to can directly included in the product cost can be divided into direct resources and indirect resources [3], because this paper to S university training different levels of students as the accounting object, so direct resources is directly included in the college of human resources, material resources and depreciation of fixed assets and amortization of intangible assets. The salary and welfare expenditure and individual family subsidy expenditure of S universities include basic salary and subsidy, which are indirect resource consumption, which cannot be directly included in the costs of the colleges and are indirect resources; the performance of scientific research reward and teaching reward issued by the colleges can be directly included in the education costs of the colleges and belong to direct resources. The commodity and service expenditure of S universities is directly included in all departments, among which the part directly included in each college belongs to direct resources, and the part included in other departments belongs to indirect resources. In addition, S colleges and universities calculate the depreciation and amortization of intangible assets of fixed assets according to their asset classes. The depreciation of fixed assets and the amortization of intangible assets

Table 1. The direct resource consumption table of some colleges in S university. Unit: Ten thousand yuan.

Department	Salary and welfare expenditure	Commodity and service expenditure	Individual and family subsidies expenditure	Total number
School of liberal arts	910.53	1129.83	1.62	2041.98
School of history	519.88	456.95	0.12	976.95
...
Total number	17892.09	18429.68	307.06	36628.83

Table 2. Indirect resources consumption table of colleges. Unit: Ten thousand yuan.

Resource Project	Indirect Resources
Salary and welfare expenditure	68215.22
Commodity and service expenditure	33516.34
Individual and family subsidies expenditure	2169.16
Depreciation and amortization	15629.91
Total number	119530.63

cannot be directly included in the educational cost of each college, which belongs to indirect resources. The direct resource consumption of each college in 2020 is as shown in (Table 1).

In addition to the above direct resources, there are still a large number of indirect resources that cannot be directly allocated. The collection of indirect resources in S universities is shown in (Table 2).

3.3 Determine the Operation Center and the Operation Items

There are hundreds of kinds of operation activities in colleges and universities, and it is not realistic to collect the cost according to the operation activities. It is necessary to divide the operation center according to the operation activities, and then collect the indirect cost according to the operation center. The accounting management system used by S university defines the types of departments according to their functions, and divides them into teaching department, teaching auxiliary department, scientific research department, administrative department and logistics department, which lays a foundation for the implementation of the operation cost method to determine the operation center. Based on the principle of importance and cost-effectiveness, and in view of the availability of data, this paper divides S university into five operation centers: teaching center, teaching auxiliary center, student management center, scientific research center, administrative center and logistics center. The scientific research activities of S university are jointly

completed by all departments, the scientific research expenses incurred in the scientific research activities carried out by each department are directly included in their respective operation centers, and the scientific research centers only collect the expenses incurred by scientific research institutions and scientific research departments.

3.4 Analyze the Cost Motivation, Collect and Distribute the Indirect Expenses

The guiding ideology of operation cost method is “operation consumes resources, product consumes operation [4]. “The first step of the concept of the operation cost method is to consume resources. When collecting the cost, the resources are first collected to the operation according to the resource motivation. If the resources consumed by S university can be directly included in the product, they shall be directly included in the product, that is, the education cost of each college; if they can be directly included in the operation center, they shall be directly included in the operation center; the resource consumption borne by the school shall be allocated to the operation center according to the resource motivation [5].

Since the staff of S University undertake the teaching task of the whole university, Therefore, the salary and welfare expenditure resources of S university selected in this paper are motivated by the number of enrolled staff; Expenditures on goods and services are directly included in the corresponding operation centers; The grants in the subsidies for individuals and families belong directly to the specific work center, the student management center. One-child reward, childcare fees and other subsidies for individual and family resources due to the number of staff, Data on the number of enrolled staff were obtained by the Personnel department, S university makes provision for depreciation and amortization according to the asset class, Failure to withdraw according to the department, Therefore, it cannot be directly added to the centers, Since the assets of colleges and universities mainly serve both teachers and students, Therefore, the depreciation and amortization resources selected in this paper are motivated by the number of enrolled staff plus the number of enrolled students, The number of current students is obtained by the Academic Affairs Office. Resource motivation and resource motivation allocation rate are shown in (Table 3).

The indirect costs collected by S universities according to the operation center are shown in (Table 4).

The second step of the operation cost method concept is the product consumption operation, The indirect costs collected by the operation center shall be allocated to the product according to the operation motivation, That is, included in the educational cost of each college, Teaching centers and teaching auxiliary centers are mainly engaged in teaching or auxiliary teaching, Therefore, the teaching workload selected by the teaching center and the teaching auxiliary center is [6], The teaching workload data comes from the teaching grade points calculated by the Academic Affairs Office according to certain standards, The student management center and the scientific research center mainly serve the students, Selected assignments due to the number of current students, The administrative center mainly serves the teachers, The number of staff on the list, The logistics center serves all the teachers and students, The selection of operation is the number of students plus the number of staff, The allocation rates of work drivers and work drivers are shown in (Table 5).

Table 3. Resource motivation and resource motivation allocation rate

Resource project		Indirect expenses (ten thousand yuan)	Resource motivation	Allocation rate
Salary and welfare expenditure		68215.22	Number of enrolled staff(2723)	RMB 250,500 yuan / person
Commodity and service expenditure		33516.34	Incl to each operation center	
Individual and family subsidies expenditure	One-child reward, childcare fees and other subsidies for individual and family	389.55	Number of enrolled staff(2723)	RMB 14 million / person
	Stipend	1779.61	Assignments are exclusive and directly credited to the Student Administration Center	
Depreciation and amortization		15629.91	Number of students + number of faculty(38119)	RMB 41 million / person

Table 4. Collection table of indirect costs of the operation center Unit: Ten thousand yuan.

Operation center	Salary and Welfare Expenditure	Commodity and service expenditure	Individual and family subsidies expenditure	Depreciation and Amortization	Total number
Teaching center	52454.7		293.16	15370.90	68118.76
...
Total number	68215.22	33516.34	2169.16	15629.91	119530.63

3.5 Calculate the Cost of Education

This paper takes the school of Arts as an example to calculate the cost of education, as shown in (Table 6).

In 2020, the total cost of education of the School of Arts is 82,079,300 yuan, and the total number of students is 2,680, so the average education cost of student is 30,600

Table 5. Table of operation motivation and operation motivation allocation rate

Operation center	Indirect costs (ten thousand yuan)	Operation motivation	Motion factor of Activity	Distribution rates
Teaching center	68118.76	Teaching load	1625310.80 h	0.04 million / hour
Teaching assistance department	14911.36	Teaching load	1625310.80 h	RMB 0.01 million / hour
...
Logistics center	18660.25	Number of enrolled students + the number of enrolled staff	38119	RMB 49 million / person

Table 6. Summary of resource consumption of the College of Education

Cost type	Resource cost (ten thousand yuan)	Distribution rates	Motion factor of Activity	Distribution amount (ten thousand yuan)
Direct cost	Salary and Welfare Expenditure			910.53

	Total number			2041.98
Indirect cost	Teaching center	0.04 million / credit hour	76034.23 h	3041.37

	Total number			6165.95
Total number				8207.93

yuan / person (8207.93/2680). Under the operation cost method, the education cost can be analyzed by educational levels, which is calculated as follows:

Standard training cost per student = (direct cost + indirect cost) / number of standard students.

Among them, the number of standard students is converted according to the Measures for Supervision and Examination of Higher Education Training Cost (Trial) issued by the National Development and Reform Commission, that is, the coefficient of undergraduate students is 1,2 for full-time doctoral students and 1.5 for master students.

It can be calculated that the standard per student cost of the school of Arts is 27,300 yuan / person, the training cost of master students is 40,600 yuan / person (2.73 * 1.5), and the training cost of doctoral students is 54,600 yuan / person (2.17 * 2). Operation cost

method can reflect the training cost of different academic levels, the higher the level, the higher the training cost, the same, can also calculate the college of different professional education cost, college of Chinese language and literature, Chinese language, Chinese language international education, secretarial learning professional student education cost is 38800 yuan / person, 26500 yuan / person, 37800 yuan / person, 40600 yuan / person. It can be seen that the student cost of the school of Arts is the highest, and the difference in the cost per student is also closely related to the major.

4 Conclusions and Suggestions

In this paper, the based on the perspective of the operation cost method, the S college education cost accounting process design, concluded as follows: using operation cost method accounting education cost is feasible in theory and practice, using the operation cost method can not only accounting college different levels of education cost, can also accounting different professional education cost, under the operation cost method easy to reveal the cost and the formation of the cost factors, find the cost of the main link, thus targeted in cost control, reduce the waste of resources. In order to ensure the effective implementation of the operation cost method, the following suggestions are put forward:

Improve the professional level of accountant. Education cost accounting in practice is a new field, university accountant generally lack of cost accounting experience, related colleges and universities should strengthen the accounting cost training, and strengthen the communication with brother colleges and universities, jointly explore suitable for the education cost accounting method, and encourage university accountant out of school, into the enterprise, learn from the enterprise advanced cost accounting experience, effectively improve the level of cost accounting.

Strengthen information technology construction. Education cost accounting not only involves the financial data, also involves the non-financial data, universities should communicate with software development companies, strengthen the information construction construction, promote the implementation of wisdom campus platform, make full use of artificial intelligence to reengineering the service process, combining the reality of the school, development for the education cost accounting module, improve the efficiency of cost accounting.

References

1. Huang Qingshan, Guo Rui. Cost accounting of college education under the government accounting system [J]. *Friends of the Accounting*, 2019 (5): 91-94
2. Li Aifen. Thinking on improving the cost-accounting and cost-sharing mechanism of Higher education [J]. *Friends of the Accounting*, 2012 (12): 83-88
3. Shao Shenghua, Hu Zhenwei. Education cost accounting of colleges and universities from the operation cost method [J]. *Friends of the Accounting*, 2018 (07): 146-148
4. Wang Jingxin. Theory and applied study of operation cost calculation [M]. Dalian: Dongbei University of Finance and Economics Press, 2001:113-115
5. Liu Xialing. Using the operation cost method to construct the full cost accounting system of colleges and universities [J]. *Accounting Monthly*, 2014 (1): 22-27
6. Zhu Xiaoping, Lin Gang, Zong Wenlong. On the application of operation Cost method in Cost accounting of College Education [J]. *Accounting Monthly*, 2004 (20): 7-8

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

