

Analysis on Innovation in Cost Accounting Teaching Based on Excel

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ABSTRACT

This article analyzes the current situation of cost accounting teaching, and expounds the necessity and importance of Excel's application in cost accounting teaching. In the teaching of traditional cost accounting courses, it mostly used the method of blackboard-writing + lecture, and the teaching efficiency and teaching effect cannot meet the expected requirements. However, the innovative research of cost accounting teaching method based on Excel tries to break the limitation of traditional teaching method. Through the electronic form and data linkage, it can directly reflect the complete process of enterprise cost accounting, simplify the complexity of the teaching implementation process, in order to achieve the purpose of concretizing the content of cost accounting theory through the innovation of teaching mode and teaching method, so as to achieve good teaching effect.

Keywords: Excel, cost accounting, teaching innovation

I. INTRODUCTION

Modern cost accounting mainly uses currency as the unit of measurement, and performs management activities such as forecasting, analyzing, controlling, and evaluating the cost consumption of relevant economic entities in product production and operation. It is a new type of accounting theory developed based on traditional cost accounting, and it also can reflect the dynamic change of asset value with the change of economic environment. As one of the core courses of accounting major in colleges and universities, there are some problems in the actual teaching of cost accounting. Because it contains a large number of data and forms, the traditional teaching mode is difficult to show it clearly, resulting in the lack of intuitive and effective teaching. In this regard, Excel can be applied to the teaching of cost accounting to promote the reform and innovation of teaching methods and improve the teaching effect, so as to provide a new teaching method for cost accounting teaching and promote the reform and innovation of cost accounting teaching methods.

II. CURRENT SITUATION OF COST ACCOUNTING TEACHING

A. Low classroom efficiency

Taking the cost accounting in the cost accounting course as an example, it involves a lot of data and tables, and the data in the tables need to be obtained through calculation. In order to explain the data calculation process more conveniently, the tables existing in the teaching materials will be written on the blackboard through the form of blackboard writing. Then, the corresponding data will be calculated according to the formula, and be written in the form. Although this kind of teaching method is intuitive, it needs to spend a lot of time on blackboard writing. In this process, students may feel bored and lose interest in learning. Moreover, due to the limitation of blackboard space and classroom time, teachers can only choose some tables to write, and may directly ignore some known conditions that are often needed, which will bring some difficulties to the explanation and affect the improvement of classroom teaching efficiency [1].

B. Chaotic data analysis

The key of cost accounting lies in two aspects: one is to do well in data calculation, and the other is to make clear the data articulation. Viewing from the current situation of cost accounting teaching, it is not easy to make clear the data articulation in order to correctly calculate the data in the table. In the teaching of data calculation, blackboard writing will take up a lot

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of classroom time, and it is almost impossible for teachers to list the calculation formula of each data on the blackboard, even some key calculation processes will be omitted, which will bring some difficulties to students' understanding and memory. In the analysis of data articulation, teachers often need to use arrows to connect and express them, so as to facilitate the illustration of the articulation between different data. In the end, there are many and messy arrows on the blackboard, and students become more and more confused. And then, they have to keep flipping through textbooks, which easily frustrate students' enthusiasm and initiative for learning [2].

C. It is inconvenient to review after class

Blackboard writing cannot be kept for a long time. In order to facilitate review after class, students often need to transcribe while teachers write on the blackboard, which also requires a lot of classroom time, and the time left for students to think and understand independently is also repeatedly compressed. From the teacher's point of view, the unsaved blackboard writing will also cause inconvenience to the follow-up explanation. For example, in this class, if one example is not finished, and the teacher wants to continue to teach it in the next class, it is necessary to carry out blackboard writing again, or only reference textbooks for teaching, which will easily affect the teaching effect.

III. THE NECESSITY OF APPLYING EXCEL TO COST ACCOUNTING TEACHING

The application of Excel to cost accounting teaching is to improve the effect of classroom teaching. In the course of cost accounting, cost accounting is a key content, which mainly reflects the cost accounting process through articulation of cost data, while the cause and effect of data need to be reflected by the cost accounting table. Traditional teaching mode of blackboard writing can't show all the tables. Although PPT has been popularized with the support of information technology, it can't reflect the data calculation process, so it becomes relatively difficult for students to understand the data relationship. With the application of Excel tables, teachers can easily edit various types of tables, and display the data filling and data calculation. This can not only meet the requirements of cost accounting chart teaching, but also stimulate students' interest in learning. At the same time, it has good teaching feasibility. In colleges and universities, there is generally a course "advanced application of Excel". It is feasible to use Excel to teach cost accounting [4].

IV. THE IMPORTANCE OF APPLYING EXCEL TO COST ACCOUNTING TEACHING

A. Improving classroom teaching effect

Excel table can edit all kinds of tables and reflect the data calculation process. By using Excel software, 255 tables can be created at the same time, and can be switched quickly in the same interface. Data in different tables can be referred to each other. With cell color filling, some key data can be highlighted, and the data articulation can be more clearly displayed in front of students. Students can intuitively see the cost accounting process and understand how to make and fill in the form under the known conditions, which lays a good foundation for the follow-up teaching [5].

B. Clarifying data calculation process

In textbooks, basic data is generally regarded as a known condition due to space limitation. Although teachers will repeatedly emphasize the source and importance of basic data, it is difficult to impress students because it is not intuitive enough. As a result, they lack enough attention to basic data. Once there is no ready-made data in actual work, they will feel helpless. The application of Excel can directly reflect the whole process of data calculation. Through the enlightening education of combining theory with practice, students can better master the basic data sources. For example, in the process of cost allocation, it is necessary to understand what kind of data to be allocated can be obtained directly from the account and which needs to be calculated. And then, students can understand the source of basic data and apply what they have learned in their work [6].

C. Stimulating students' initiative consciousness

In the teaching of cost accounting, teachers should start with blank forms, and use examples in textbooks to guide students to fill in forms while calculating, and change traditional teaching into interactive teaching, so as to stimulate students' subjective initiative and improve their understanding and application ability of cost accounting knowledge.

D. Promoting the reform of teaching methods

At present, in the assessment of cost accounting courses in colleges and universities, most of the assessment is in written form, so it is impossible to cultivate and test the practical ability of students. With the influence of factors such as examination time, only part contents of the cost accounting system can be selected as the assessment contents. Therefore, it is impossible to understand the students' mastery of the whole cost accounting system and process. The application of Excel can promote the reform of teaching assessment and cultivate students' ability to solve

problems independently. Specifically, on the one hand, when assigning exercises after class, students can be required to complete cost accounting by using Excel tables. And teachers should encourage students to practice while learning, so as to cultivate their practical ability. On the other hand, starting from the characteristics of enterprise cost accounting, computer test can be added to the assessment. When basic data and conditions are known, students are required to choose cost accounting method system according to their own knowledge, and use Excel to complete the preparation of tables and cost accounting [7].

E. Improving the overall quality of students

The application of Excel in cost accounting teaching can reflect the cost accounting process more intuitively. And students can realize that cost accounting is a linked process. They must be careful to ensure a good accounting effect, which will guide students to form a rigorous and meticulous professional quality. On the other hand, students can intuitively see the importance of basic data. If part of the data is missing, the cost accounting cannot be carried out smoothly. In actual work, the cost accounting data needs to be provided by the personnel of other departments. Therefore, in order to ensure the timely and accurate cost accounting, students need to strengthen the communication and exchange with the relevant departments, which can cultivate students to form a good team spirit and improve the overall quality of students.

V. THE SPECIFIC APPLICATION OF EXCEL IN THE INNOVATION OF COST ACCOUNTING TEACHING

The application of Excel software in cost accounting teaching is mainly reflected in three different links.

A. Pre-class preparation

In the pre-class preparation, teachers can make Excel forms for teaching in advance, so as to save the time needed for blackboard writing and leave more time for students to think. Using multimedia teaching equipment to explain directly can greatly improve the efficiency of classroom teaching. Many data in textbook examples will be used repeatedly. Teachers can put it in Excel table in advance and show it to students, so that students can understand the importance of basic data in cost accounting more intuitively [8]. The data of the examples in the textbook are all displayed through fixed tables. Students can't distinguish which data are known and which need to be solved, which leads to fuzzy thinking. Teachers use the font color function in Excel tables to distinguish data types, highlight key words and sentences and data

through different colors, and remind students to pay attention [9].

B. Classroom teaching

In the classroom teaching, teachers use the pre-made forms to analyze the sample questions, and show the data calculation process and the data articulation clearly. When explaining the calculation process of the example, it is necessary to give priority to the formula function of Excel itself to calculate the data and show the whole process of data calculation in a more three-dimensional form.

Specifically, the main contents of cost calculation include: the distribution and calculation of direct materials and direct labor, the collection and distribution of manufacturing costs, which is not only the focus of teaching, but also the difficulty of teachers in the process of explanation. Actually, teachers can use Excel teaching to solve these problems. For example, in the calculation of material cost, if an enterprise produces more than two kinds of products, it is difficult to understand and remember the calculation of material distribution rate and material consumption of a product. In this example, X material (1796kg) is used in the production workshop to produce A and B products this month. The unit cost of X material is 12500 yuan, the quota consumption of A product is 1.8kg, and the quota consumption of B product is 3.5kg. It can use Excel to directly enter " $=E5/(B3*C3+B4*C4)$ " in the cell (as shown in "Table I"). And then, it can click the Enter key to automatically calculate the data in the cell D3, and display the calculation formula [10] in the "Edit bar". If teachers click the mouse to the formula bar, the complete calculation formula can be displayed, and the corresponding source of the data can be quickly found with the help of different colors, which is not only convenient for teachers to analyze the formula step by step, but also easy for students to understand. At the same time, when the formula is set, even if the example is changed, it does not need to set repeatedly, just need to input the known data to the corresponding position of the table, that is, the data can be calculated and processed automatically. No matter how the quota consumption and production hours change, it can be quickly calculated by using the formula in the table. Students can see the calculation process clearly, and draw inferences about other cases from one instance. In this example, the same method can be used for X material consumption. Teachers can enter $=B3*C3*D3$ in the cell and hit enter directly (as shown in "Table II").

TABLE I. X MATERIAL DISTRIBUTION RATE FORMULA

SUMIF X ✓ fx =E5/(B3+C3+B4+C4)						
A	B	C	D	E	F	G
X material distribution table						
	Rated consumption (kg)	Production hours (hours)	Distribution rate	Material consumption	Unit cost (yuan)	Total cost (yuan)
A product	1.8	120		250.93	12500	3136625
B product	3.5	380	1.1617	1545.07	12500	19313375
Total				1796		22450000

TABLE II. SCHEMATIC DIAGRAM OF X CONSUMPTION FORMULA FOR A PRODUCT

SUMIF X ✓ fx =B3+C3*D3						
A	B	C	D	E	F	G
X material distribution table						
	Rated consumption (kg)	Production hours (hours)	Distribution rate	Material consumption	Unit cost (yuan)	Total cost (yuan)
A product	1.8	120	1.1617	=B3*C3*D3	12500	3136625
B product	3.5	380	1.1617	1545.07	12500	19313375
Total				1796		22450000

The distribution of employee compensation is divided into two types: one is to be analyzed and calculated, such as the employee compensation of production workshop personnel; the other is to get data without calculation, such as the employee compensation of management personnel. In this case, the total employee compensation calculated by the human resources department of the enterprise is 1265500 yuan. Among them, 620000 yuan is paid to the workers in the production workshop, and 85000 yuan is paid for welfare. 90000 yuan is paid to the managers in the workshop, and 12000 yuan is paid for welfare. 320000 yuan is paid to the staff in the administrative department. 138500 yuan is paid to the staff in the sales department. Since the enterprise produces two product A and B, it needs to distribute the

wages and welfare expenses of workshop workers between the product A and B. Therefore, the calculation of wage distribution rate is the key and difficult point of this teaching link. Teachers use Excel to input "=\$E\$13/\$C\$13" (as shown in "Table III") in the cell, and it can automatically calculate the data of cell D11. When clicking the mouse to display the calculation formula in the "Edit bar", teachers can make the explanation step by step with the help of different color decomposition formula. The repeated operation from direct material calculation to direct manual distribution rate calculation can deepen students' impression and establish the connection between knowledges. The data can be explained and input at the same time, so that students can master two different calculation methods of salary.

TABLE III. CALCULATION FORMULA OF DIRECT LABOR DISTRIBUTION RATE OF PRODUCT A

Distribution of employee compensation				
target group	Product name	Product name assignment criteria (hours)	Distribution rate	Distribution amount
Production workshop	A product	120	= \$E\$13 / \$C\$13	169200
	B product	380	1410	535800
	Subtotal	500		705000
	welfare funds			12000
	Workshop Manager			90000
	management			320000
	salesman			138500
	Total			1265500

The interactive allocation method of auxiliary cost in manufacturing cost is a difficult point in cost accounting teaching, and also one of the most difficult knowledge for students to understand. It involves two assignments, that is, the internal assignment between

auxiliary production workshops and the assignment of each beneficial department outside the auxiliary production workshops, that is, the external assignment. In the traditional teaching and learning, students have not yet contacted the enterprise business, and have

difficulties in the imagination and understanding. Teachers can use Excel to visualize the whole distribution process. For example, in this example, the

enterprise has two auxiliary production departments: machine repair and power supply. The related consumption is shown in the "Table IV":

TABLE IV. RELATED CONSUMPTION

Name of auxiliary production workshop		Power supply workshop	Machine shop
Auxiliary production cost to be allocated in machine repair workshop (yuan)		550000	180000
Labor quantity (kWh / h)		1100000	5000
Labor consumption (kWh / h)	Machine shop	90000	
	Power supply workshop		1000
	Production workshop	800000	2000
	Administrative department	60000	500
Engineering Department		150000	1500

Internal distribution is to allocate the power consumed by the machine workshop into the cost of the machine workshop, and allocate the repair cost consumed by the power supply workshop into the cost of the power supply workshop, that is, the first distribution. Internal distribution involves the understanding and calculation of distribution rate and amount. Teachers can use Excel to explain the calculation formula of distribution rate and input " $=D23/D24$ " in the cell at the same time to automatically calculate the result of distribution rate, that is, the data of D25 (as shown in "Table V"). Distribution amount = distribution rate * consumption quantity. Teachers can make the explanation by entering the formula " $=D25*D26$ " (see "Table VI"). The second allocation is external allocation, which

needs to be reallocated with the result of the first allocation. Therefore, the calculation of external allocation amount is the key and difficult point of this phase. Teachers use the formula display function of Excel to break down the formula and explain it item by item. The external allocation amount = the expenses to be allocated in this department - the department expenses consumed by other departments + the other department expenses consumed by this department (as shown in "Table VII"). Even if the class time is limited and some students don't fully understand it, teachers can send the examples in Excel to students by using cloud platform, which is convenient for students to digest one by one after class, solving the problems that the data in paper teaching plan can't be changed and the PPT teaching plan data can't be linked.

TABLE V. CALCULATION FORMULA OF AUXILIARY PRODUCTION COST ALLOCATION RATE

project		Interactive allocation			
Product supply workshop		Power supply workshop	Machine shop	Total	
Product expenses to be allocated		550000	180000	730000	
Quantity of products to be allocated		1100000	5000		
Distribution rate		$=D23 / D24$	36		
Beneficiaries and amount	Machine shop	Quantity	90000		
		Amount	45000	45000	
	Power supply workshop	Quantity		1000	
		Amount		36000	36000
	Production workshop	Quantity			
		Amount			
	administrative department	Quantity			
		Amount			
	Engineering Department	Quantity			
		Amount			
Total					

TABLE VI. CALCULATION FORMULA OF DISTRIBUTION AMOUNT OF AUXILIARY PRODUCTION COST

		A	B	C	D	E	F
19							
20		Interactive allocation of auxiliary production cost					
21		project			Interactive allocation		
22		Product supply workshop			Power supply workshop	Machine shop	Total
23		Product expenses to be allocated			550000	180000	730000
24		Quantity of products to be allocated			1100000	5000	
25		Distribution rate			0.5	36	
26			Machine shop	Quantity	90000		
27				Amount	=D25*D26		45000
28			Power supply workshop	Quantity		1000	
29				Amount		36000	36000
30	Beneficiaries and amount		Production workshop	Quantity			
31				Amount			
32			administrative department	Quantity			
33				Amount			
34			Engineering Department	Quantity			
35				Amount			
36		Total					

TABLE VII. CALCULATION FORMULA OF INTERACTIVE ALLOCATION OF AUXILIARY PRODUCTION COST

		A	B	C	D	E	F	G	H
19									
20		Interactive allocation of auxiliary production cost							
21		project			Interactive allocation			External distribution	
22		Product supply workshop			Power supply workshop	Machine shop	Total	Power supply workshop	Machine shop
23		Product expenses to be allocated			550000	180000	730000	=D23-D27+E29	189000
24		Quantity of products to be allocated			1100000	5000		1010000	4000
25		Distribution rate			0.5	36		0.535643564	47.25
26			Machine shop	Quantity	90000				
27				Amount	45000		45000		
28			Power supply workshop	Quantity		1000			
29				Amount		36000	36000		
30	Beneficiaries and amount		Production workshop	Quantity				800000	2000
31				Amount				428514.8515	94500
32			administrative department	Quantity				60000	500
33				Amount				32138.61386	23625
34			Engineering Department	Quantity				150000	1500
35				Amount				80346.53465	70875
36		Total						541000	189000

The collection of manufacturing costs needs to take data from the above-mentioned tables, which is easy to be confused by students. In teaching, it can cooperate with the formula review function to clarify the data articulation. In Excel, formula approval is mainly for formula cells (cells with formula defined). Teachers can find out which cell data is calculated by the operation of "tools — formula approval — track reference cells". The arrows displayed in the tracking and reference cell function can help students to see the data articulation more intuitively and provide convenience for teaching. If teachers want to clear the arrows, just need to click "tools — formula review — cancel all tracking arrows" successively [11] (as shown in "Table VIII"). The data source of the amount to be allocated to other parties in the above interactive allocation can also be displayed in this way (as shown in "Table IX").

TABLE VIII. SCHEMATIC DIAGRAM OF MANUFACTURING COST COLLECTION

Distribution of employee compensation				
target group	Product name	Product name assignment criteria (hours)	Distribution rate	Distribution amount
Production workshop	A product	120	1410	169200
	B product	380	1410	535800
	Subtotal	500		705000
welfare funds				12000
Workshop Manager management				90000
salesman				320000
Total				138500
Total				1265500

Summary of manufacturing costs	
Product name	Amount
wages	90000.00
welfare funds	12000.00
water and electricity	523014.85
depreciation charge	325000.00
maintenance cost	28000.00
other expenses	46500.00
Total	1024514.85

TABLE IX. SCHEMATIC DIAGRAM OF DATA SOURCES FOR INTERACTIVE ALLOCATION OF AUXILIARY PRODUCTION COSTS

Interactive allocation of auxiliary production cost							
project		Interactive allocation			External distribution		
Product supply workshop		Power supply workshop	Machine shop	Total	Power supply workshop	Machine shop	Total
Product expenses to be allocated		550000	180000	730000	541000	189000	730000
Quantity of products to be allocated		1100000	5000		1010000	4000	
Distribution rate		0.5	36		0.535643564	47.25	
Beneficiaries and amount	Machine shop	Quantity	30000				
		Amount	45000		45000		
	Power supply workshop	Quantity		1000			
		Amount		36000	36000		
	Production workshop	Quantity				800000	2000
		Amount				428514.8515	94500
	administrative department	Quantity				60000	500
		Amount				32138.61386	23625
	Engineering Department	Quantity				150000	1500
		Amount				80346.53465	70875
Total					541000	189000	730000

Another key point of cost accounting teaching is the distribution of the finished products and work-in-process cost. Enterprises usually calculate the cost according to the equivalent production proportion method. Teachers use Excel tables to directly display the calculation process of equivalent production, and then explain the meaning of equivalent production, so as to make abstract knowledge concrete. In this case, 550 A products were put into production this month, and 330 were completed at the end of the month. Teachers use Excel to make the explanation step by step in the teaching process. The first step is to calculate the current production cost. Teachers explain the calculation process of the cost of product A, and let the students try to analyze and calculate the production

cost of product B by themselves according to the formula in the Excel table and the corresponding data source, which plays a role of analogy. (See "Table X").

TABLE X. COST CALCULATION FORMULA OF PRODUCT A

Product cost calculation sheet			
Project	Cost of products in process at the beginning of the month	Production cost of this month	Total production cost
A product	Direct material	548800.00	3136625.00
	Direct labor	32000.00	169200.00
	Manufacturing expenses	60000.00	245883.56
	Total	640800.00	3551708.56

The second step is to calculate the cost of finished products and the work-in-process cost. With the introduction of knowledge mentioned above, this point becomes relatively easy. Teachers can guide students to dictate and input relevant formulas in Excel at the same time, and then let students check whether their understanding of knowledge is in place through formula review and function display.

C. After-class review

It is unrealistic to require all students to fully understand and master the corresponding knowledge points only through one-class explanation. Therefore, it is necessary to guide the students to do a good job of review after class. Different from the traditional blackboard writing, the excel forms made by teachers can be saved for a long time, and can be uploaded to the school public teaching platform for students to download and review. When the whole process of product cost collection and calculation is finished, teachers can use the advantages of Excel to guide students to comb again from the beginning by using the formula set previously without erasing the blackboard, so that students can realize the link of knowledge from point to face after learning one by one. At this time, if teachers want to know the students' mastery through the exercises, it is also very easy. They can change the questions at will, easily realize the calculation, and find the problems of the students in time. For some specific problems, they can use any of the above tables, which can not only complete the repeated explanation, but also save the time from the beginning of explanation and calculation.

Before uploading the form, it is necessary to ensure that all data can be calculated by formula, so that students can review knowledge points by viewing excel form even if they don't understand in class. By clicking the corresponding cell, the corresponding calculation formula will be displayed in the "edit column", and the "formula review" function can also be used to clarify the data articulation. Students no longer need to spend a lot of time and energy to record classroom notes, and can spare more time to think. Such a teaching method can also provide good support for students' autonomous

learning and help improve their autonomy and initiative for learning [12].

VI. CONCLUSION

All in all, in the market economy environment, enterprises put forward higher requirements for the quality of accounting professionals. In the process of carrying out cost accounting teaching, colleges and universities should make a comprehensive analysis, clarify the problems and deficiencies in teaching, make necessary improvements and innovations, introduce Excel into the whole process of cost accounting teaching, give full play to the advantages of Excel, improve the effectiveness of classroom teaching, and ensure the smooth development of teaching. Not only that, the application of Excel in cost accounting teaching enables students to contact and understand the role of software in financial accounting, which lays a good foundation for future accounting practice.

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