

Activity- Based Cost Method– A Case Study of an Under Graduate College

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Abstract

Education is important for the growth and development of a country. Money invested in education always gives the best return. Higher education, in particular, is essential for developing human assets in a country and is provided through colleges and universities. It provides an opportunity for the students to develop and upgrade their overall knowledge and helps in personality development. But throughout the world, higher education is in crisis due to a financial resource crunch. It is a big challenge for the developing countries to impart and increase higher education with these resource constraints. The different demand-supply gap in higher education makes it very competitive for the students, staff, and resources. The cost of higher education is increasing daily and becoming expensive. India is a developing and youth-centric country, so proper accounting and distribution of higher education costs are relevant and essential here. Cost accounting helps in the proper calculation and control of costs. Activity-based costing is especially useful here as it gives a proper and accurate distribution of indirect costs. This will help in better utilization of limited available resources for higher education. The present paper attempts to calculate the cost of higher education in an undergraduate college by using Activity Based Costing.

Keywords – Cost, Higher Education, ABC, Student, Cost Accounting

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Section – 1.1 Introduction

The social and economic development of a country is based on the growth of its higher education. But throughout the world, higher education is in crisis. Most the countries of the world are under the challenge of how to impart and increase higher education as their financial resources are shrinking. This resource crisis is most acute in developing countries, as they have several financial issues. Higher education requires a significant investment of resources in human resource development. Human assets are created through teaching-learning, training, research and development activities, interactive sessions between students and teachers, extracurricular activities, etc., in the colleges or institutes of higher education. The gap between supply and demand in higher education makes it very competitive in terms of students, staff and resources. In India also, higher education is considered necessary for the

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growth and development of society. However, due to scarcity of resources, governments are privatizing the higher education sector, and higher education is becoming expensive daily. India is a developing and youth-centric country, so proper accounting and distribution of the cost of higher education is essential and relevant here. The product of higher education is students, and all the resources used in the college are termed education costs. Suppose we ignore the proper cost calculation in higher education. In that case, it will waste scarce financial resources and fail to benefit more young people to have higher education. Therefore, cost accounting and management of college education are vital to maximizing the use of invaluable college resources.

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Section- 1.2

Concept of cost and cost accounting

Cost is the money required to purchase, do, or manufacture anything. We can say cost is the price paid to acquire and produce something. The process of cost calculation is covered under cost accounting. The primary purpose of cost accounting is cost calculation, reduction, and control of cost in any organization. To achieve these purposes, we have a very detailed cost classification and concepts in cost accounting. In this study, only two types of cost are relevant and have been used. These are direct and indirect costs – Direct costs are the costs that are quickly and conveniently identifiable with a particular product, department, or centre, such as raw material, labour, etc. These costs are directly allocated to a product, and there is no need to distribute or apportion these costs to different products. On the other hand, indirect costs are the costs that can not be easily traced or identified to a product, department, or centre, such as electricity, supervision cost, management salary, etc. As the indirect costs are shared costs, they need to be distributed or allocated among the departments making use of these costs. These indirect costs are termed overheads in cost accounting. For allocation of indirect costs, we have two methods – The traditional method and the Activity-based costing method. The traditional method of distribution results in under costing or costing to some departments or products..An activity-based cost allocation method has been developed to address this issue. Activity-based costing assigns overhead costs to products more logically than the traditional method of allocating costs only on a single basis. Activity-based costing first assigns costs to the activities, which are the leading cause of the overhead costs. Then the cost of these activities is assigned only to the products using the activities. In recent years activity-based cost allocation has become necessary due to the diversity of products, and the demands of customers are also diversifying. Activity-based costing may be used for overhead distribution decisions, budgeting, product pricing, etc.

Section – 1.3

Review of Literature

“As the "product" of higher education-students, namely the training object, all kinds of resource consumption in the process of training constitute the education cost. If we don't pay attention to the input and output of education, it will lead to the waste of financial expenditure and fail to benefit more young people with excellent higher educational resources. Therefore, cost accounting and management of higher education are of vital importance to maximize the use of precious university resources”¹.

In another study, “The author presents empirical evidence of and various theoretical justifications for, increasing cost sharing throughout the world in the forms of tuitions and fees,

the diminishing real value of students maintenance grants and an increasing reliance on private forms of higher education. Resistance to cost sharing, both ideological and strategic is also analysed. The author also refers policy alternatives such as grants versus loans and the criteria for an appropriate tuition level, as well as the impact of cost sharing on enrolment behaviour. He concludes that increased cost sharing is probably inevitable, less than on the basis of the classical neoliberal economic claim for greater equity and efficiency than on the basis of the sheer need for revenue and the increasing priority of alternative claims on public treasuries".ⁱⁱ

Another Indian paper also concluded "Cost sharing in higher education refers to a shift in the burden of higher education". The paper concluded that the cost from being borne exclusively or predominately by the government or taxpayers, to being shared with parents and students. Freezing of student grants and reduction of the effective grants also leads to shifts of cost burden from government to students and family, changes in the public policies may also shifts the enrolments. In all these ways and in combinations the burden of higher education costs worldwide is being shifted from government or taxpayers to students and families".ⁱⁱⁱ

Section 1.4

Activity Based Costing in Education

Activity based costing process is: products – activity or activity – resources. The diversified courses offered by the college lead to inconsistent teaching costs and resource usage. Under ABC cost method, it is necessary to carry out resource analysis, Formation of resource centre, identify cost driver, divide amount to resource centre, and then again allocate total amount to the product. The activities in colleges include regular teaching, subsidiary teaching, research work, administrative management and asset management. Cost of a student includes teaching, research/ laboratory/ experiments, administrative, subsidiary teaching and assets maintenance cost.

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Section -2

2.1 Objectives

The following are the Objectives of the paper:

1. Using the Activity Based Costing method, calculate the cost of higher education in a college that offers a variety of courses.
2. The cost per student is calculated and compared for the college's three most popular courses. These are B.A. (Hons.) Business Economics (BBE), B.A. (Hons.) Applied Psychology (Psychology), and B.Com & B.Com(Hons) (Commerce). The costs of these courses affects the fee structure of these courses as well as the better use of scarce resources in higher education.
3. Determine whether allocating the cost of a college education using activity-based costing is more beneficial than traditional accounting methods.

2.2 Analysis of college-wise and course-wise total cost of education

The college offers academic and professional courses under the three-year Bachelor-Degree Program. The main academic programs include B.Com. & B Com (Hons.), B.A.(Hons.) Geography, B.A.(Hons.) History, B.A. Hons. (Economics) and B.A. (programs).

The college also offers professional courses such as B.A. (Hons.) Social Work, B.A.(Hons.) Business Economics, B.A. (Hons.) Hindi Journalism and B.A. (Hons.) Applied Psychology.

These Under Graduate and Professional Courses are offered by the department: Commerce, Economics, Language (English and Hindi), Psychology, Humanities, Geography, Social work, and Business Economics. Four buildings are used to run these courses. The total number of students in the college in a year is 3385, and staff includes complete-time teachers - 148, sports and librarian staff - 25, computer lab /laboratory staff - 33, and administrative staff - 42.

The teaching and other activities of the college may be summarized into five working units: The core working units cover daily teaching tasks, including daily teaching class, exam duty, paper checking, orientation courses /Faculty Development Program, and other co-curricular activities.

Books and journals that aid the teaching work unit include the Purchase and maintenance of library resources, the construction and maintenance of computer lab and other laboratories, the cost of the college internet network, develop e-content and interactive board with projector, Purchase of experimental instruments and maintenance of Social science experimental Lab and construction and maintenance of college building.

2.3 Resource Units Analysis

All the activities of the college are divided into five **Resource units**.

1. Teaching Resource units- It includes the teaching hours of the major subjects, minor subjects, counselling hours, invigilation hours, and motivation hours on cultural and other educational activities.

2. Students Resource units- It includes the hours spent on cultural, sports, placement , equal opportunity activities, yoga activities, publication of articles in magazines/journals, library ,Maintenance of garden, hygiene activities, and other academic activities.

3. Experimental and Computer Resource units-The unit covers the hours spent on research work and practical work in Computer/Social Laboratory.

4. Administration and Management Resource units-It includes the hours spent preparing colleges' budgets and collecting and maintaining the funds from different sources. It also comprises the hour spent on Payroll, collection of fees, admissions, examination, issuing the various course forms/certificates, and Financial and internal audits.

5. Asset Service Resource units-The regular working hours of the Purchase of hardware facilities and verification of tools used in teaching, repairs and maintenance of college building and infrastructure are included.

2.4 Resource Driver Analysis

The primary component of the ABC costing method is the resource driver, which counts the number of resources used by an activity. It is used to assign cost of resource's to an activity. ABC's accuracy is directly affected by the proper identification of resource drivers. The following principles underpin resource driver analysis: First, there is a direct relationship between resource catalyst and resource consumption. Second, resource drivers are easily obtained and measured in the accounting process. Finally, if a resource is used only for one assignment, it can be directly credited to the resource unit . Some resources, such as water and electricity charges in classrooms, are not exclusive to a specific course or department and must be allocated on a reasonable basis. These resources are shared by multiple cost unit . The corresponding activity cost basis will be determined after the resource cost of each resource unit is calculated.

2.5 Cost Driver Analysis

The cost driver is an essential component of the ABC costing Method. It serves as the foundation for accounting for resource consumption in resource units. The verification of the cost driver has a direct impact on the accuracy of ABC. As a rule, each job should only be assigned based on one cost driver. In practice, if a resource is only used for a specific task, it can be directly allocated to the resource units such as a scholarship directly credited to the Students Resource unit. However, some resources are not directly associated with a specific resource Centre, such as office expenses, which are allocated to all five resource units based on a specific cost driver.

2.6 Assets and Depreciation of the College :

The college has fixed assets – a building area of 8094 square meters. The number of computers/ interactive boards and projectors (including desktops installed in computer labs, office & administration, and library) is 500 valued @ Rs.67000 per unit, and the total value is Rs 335 lacs. The total value of teaching and laboratory equipment is about Rs 189 lacs. There are 253 lacs paper books and 4 lacs electronic books in the library valued at Rs. 68 lacs.

The college started working in April 2015. Depreciation for building structure, furniture, and the teaching and laboratory assets is charged on the straight-line method, and the residual value is taken as nil at the end of life. The service life of college buildings and computers is 50 and 10 years, respectively. For books, lab equipment, and furniture, life is assumed as 20 years. (Table-1)

Table1- Calculation of depreciation on fixed assets of college for the year ended March 2022:

(Rs in Lacs)

Assets	Cost	Life (in years)	Rate of Depreciation Per annum	Annual depreciation
Building Structure	478	50	2%	9.56
Computers	335	10	10%	33.5
Books, Lab equipment's and Furniture	257	20	5%	12.85
Total				55.91(aapprox-56)

2.7 Variable Cost of the College for the year ended 2022

As per the college financial statements and expenditure details for the year 2022, Salary and allowances are all personnel expenditures incurred to ensure the regular operation of education. Subsidies and grants received are not considered. Details of the education cost are shown in (Table 2)

Table-2 Annual Details of Education Cost of the College for the year ended 2022 :

(Rs. in Lacs)

Variable Cost	Amount	Amount
Personnel Expenditure: -	3750	
Salary & Allowances expenditure		3742
Scholarships		8
Office & other Expenses		208
Repair and Maintenances Expenses		13
Computer Lab./ Laboratory and Librarian Expenses.		360
Total		4331

2.8 Allocation of Annual Cost to Resource Units

The educational activities and other activities in colleges are related to each other. According to the principle of the resource unit, the actual number of office employees and teaching staff

is taken as a cost driver. First, the resource allocated by each resource unit, such as salary, welfare, and office expenditure, may be taken as the cost driver according to the number of teaching staff and office employees. Second, the unique used related resources, as the only catalyst of the unit, are directly included in the relevant resource unit. The Resource catalyst allocation table of the college is shown in Table -3.

Table -3. Allocation of Annual Cost to Resource Units of the College:

(Rs in Lacs)							
Expenditures	Amount	Cost Driver	Teaching Resource units Amount	Experimental and Computer Resource units Amount	Students Resource units Amount	Administration Management Resource units Amount	Asset Service Resource units Amount
Salary and allowances expenditures	3,742	Actual no. of Staff	2,233	498	377	634	
Scholarships	8	Unique Way			8		
Office expenses and other expenses	208	Actual no. of Employees	124	28	21	35	
Computer Lab /Laboratory/ librarian	360	Equally distributed	215	48	36	61	
Asset maintenance (repair)	13	Unique way					13
Depreciation	56	Unique way					56
Total	4387		2572	574	442	730	69

2.9 Summarization of Annual Cost of Resource Units

The following are the five activity-based cost databases formed after resource allocation: Teaching Resource units, Experimental and Computer Resource units, Students Resource units, Administration Management Resource units, and Asset-Service Resource units. (Table-4)

Table-4 Distribution of Annual Cost of Resource Units :

Resource units	Annual Cost (Amount in Rs. lacs)
Teaching Resource units	2572
Experimental and Computer Resource units	574
Students Resource units,	442
Administration Management Resource units	730
Asset-Service Resource units	69

Total	4387
No of students in College	3385
Cost per Student per annum in Rs lacs (Traditional Method)	1.30

As per **Traditional Method Cost** per student per annum is Rs 1.30 Lacs.

2.10 Catalyst Rate

According to the principle of the relevance of the resource unit, the working process of the teaching resource units includes teaching, admission process, timetable and schedule, and result assessment . The cost driver of the Teaching working Centre is actual class hours. Experimental and Computer Resource units, Students Resource units, Administration Management Resource units, and Asset-Service Resource units provide service to students. The cost drivers of these resource unit are determined by the number of students who avail resource services. (Table-5)

Table -5 Activity Cost Allocation and Determination of Catalyst Rate of Resource Units:

Resource Units	Annual Cost (Amount in Rs. lacs)	Catalyst - Drivers*	Total Catalyst	Catalyst Rate
Teaching Resource Units	2572	Actual no of hours	247200*	0.01
Experimental and Computer Resource units	574	Actual no of students	3385	0.16
Students Resource units,	442	“	3385	0.13
Administration Management Resource units	730	“	3385	0.22
Asset- Service Resource units	69	“	3385	0.02
Total	4387			

*Total Teaching Hours - 206 x 200 days x 6 hrs= 247200 hours

2.11 Brief Introduction of Three Main Courses

The main academic program is B.A. (Hons.) Applied Psychology, {B.A.(Hons.) Business Economics and B.Com. & B Com (Hons.)}. The department offers the Under Graduate and Professional Courses: Of psychology, Business Economics, and Commerce. The department teachers include Laboratory Teachers, computer assistants, and subsidiary subject teachers. The number of students enrolled in a specific course in all three years.(Table-6)

Table 6 Details of three Courses in respect of Staff and Students

Department	No of teachers	No of students
Psychology -{B.A. (Hons.) Applied Psychology.}	18	180
BBE {B.A.(Hons.) Business Economics,}	14	120
Commerce {(B.Com. & B Com (Hons).}	35	1000

2.12 Cost Comparison of the Three Courses

To compare the cost between the three courses, the Cost allocation is done on the same basis as done in (Table -5)

Table 7 Calculation of Cost per student under ABC Cost Method:

Particulars/ Working centre	College Catalyst Rate Factor	Psychology	Annual Cost (Amount in Rs. lacs)	BBE	Annual Cost (Amount in Rs. lacs)	COMMERCE	Annual Cost (Amount in Rs. lacs)
Teaching Resource units	0.01	21600*	216	16800**	168	43200***	432
(A)Experimental and Computer Resource units	0.16	-	-	-	-	1000	160
(A)Experimental and Computer Resource units	0.232****	180	41.76	120	27.84	-	-
Students Resource units,	0.13	180	23.40	120	15.6	1000	130
Administration Management Resource units	0.22	180	39.60	120	26.4	1000	220
Asset- Service Resource units	0.02	180	3.6	120	2.4	1000	20
Total			324.36		240.24		962
Cost per student per annum			1.80		2.002		0.962

*18x200 daysx6hrs =21600

**14x200 daysx6hrs=16800

*** 35x200daysx6hrs=43200

****For Psychology & BBE Students Practical Lab Time is more by 45% then other Departments or courses, hence the cost has been appropriated accordingly .

Table 8 shows cost calculation per student for the three courses as per the ABC Method Cost Method.

Table 8 Cost-sheet showing cost per student for three course under ABC Cost Method

Courses	Cost Per students PA
PSYCHOLOGY	Rs 1.80 Lacs PA
BBE	Rs 2.00 Lacs PA
COMMERCE	Rs. 0.96 Lacs PA

Section 3

Conclusion

It is summarized that the present study is based on the application of the activity-based costing and calculates the cost of a college student under the ABC method. It is a scientific method of charging overhead costs. Costs are first identified to the activities and then charged to products. Cost is calculated on the basis of the activities or services used by a product. The activity-based method is more accurate and reliable for overhead distribution and cost calculation than the traditional method of overhead distribution. Under the traditional method cost per student per annum for the three courses is equal, whereas under the ABC method cost per student per annum for the three courses is different. Cost calculation as per the ABC method is more accurate as the resource requirement of the three courses is different. The college courses are diversified and require diversified resource consumption. The application of the ABC method is more appropriate here. Identify the resource consumption, and then make appropriate distribution/ allocation of resources to improve the overall performance of the colleges.

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