

Use of Time-Driven Activity-Based Costing to Calculate the Unit Cost per Students at Faculty of Economics of Universitas Pendidikan Ganesha

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Abstract—*Universitas Pendidikan Ganesha (Undiksha) is one of the state universities that has changed its status to become a Public Service Agency (Badan Layanan Umum/BLU). As a consequence of these, Undiksha has the flexibility to carry out financial management based on various regulations and policies regarding BLU. Revenue from student tuition fees is the main income to run Undiksha's operational activities. Therefore, it is very important for Undiksha to analyze the cost per students semester. The results of the analysis of the cost per students every semester can be used as a basis for determining the tuition fees to be paid by each student every semester. The aims of this study were to determine how much the unit cost per students every semester in each study programs contained in the Undiksha's Faculty of Economics. Cost analysis is performed by using the Time-Driven Activity-Based Costing approach. Undiksha's Faculty of Economics has five study programs: Economics Education program, Management program, Accounting program, Accounting diploma program and Hospitality diploma program. The results of this study showed that tuition fees for students Economics Education program, Management program, Accounting program, Accounting Diploma program and Hospitality Diploma program are lower than the unit cost per student. Thus, in order to cover the unit cost per student on every study programs, Undiksha's Faculty of Economics should recalculated the unit cost per student to set reasonable tuition fees.*

Keyword: *unit cost per students, time-driven activity-based costing, students tuition fees*

I. INTRODUCTION

The government has created a new model in the management of public service agencies by implementing the Public Service Agency Financial Management Pattern (PPK BLU). The Public Service Agency's Financial Management Pattern is a financial management pattern that provides flexibility in the form of freedom to implement sound business practices to improve services to the public in order to promote public welfare and educate the lives of the nation. This model is expected to be a prominent concrete example of the implementation of performance-based financial management. Government agencies whose main tasks and functions provide services to the community are encouraged to implement

flexible financial management patterns by highlighting productivity, efficiency and effectiveness.

Universitas Pendidikan Ganesha based on the Decree of the Minister of Finance Number 505/KMK.05/2015 has been ratified as one of the state universities that has changed its status to a Public Service Agency. As a consequence of the status change, Undiksha has the flexibility to carry out financial management based on various regulations and policies on public service agency.

Student tuition is one of Undiksha's main revenues to run its operations. Therefore, it is very important for Undiksha to analyze the unit cost of students. The results of an analysis of the unit cost of students can be used as a basis for determining the single tuition that must be borne by each student while studying at Undiksha while still maintaining the quality and competitiveness of each existing study program.

Minister of Education and Culture Regulation Number 55 of 2013 which has been changed into Minister of Education and Culture Regulation Number 73 of 2014 concerning Single Tuition for State Universities explains that the basic unit cost is calculated using activity based costing (ABC) methods which take into account all operational costs and non-cost operational. Operational costs are divided into direct operating costs and indirect operating costs (indirect operating costs) or institutional overhead.

Activity based costing method has been developed since 1980 by Cooper and Kaplan (Kumar, 2013; Lima, 2011), as one method of determining cost of goods manufactured that can provide more accurate information about the cost per product or service to the company, compared to the method traditional (Amir, 2012; Lima, 2011; Tapanjeh, 2008; Lucas, 2005). The ABC method has advantages over traditional methods in terms of accuracy, reliability and relevance to the assessment of the cost of products or services. However, the ABC method also has a weakness that causes the company's management to have difficulty in implementing and applying it mainly because of the large costs and the amount of effort spent.

The problems which found in the ABC method above are the background for Kaplan and Anderson to developed a new model in ABC, namely the Time Driven Activity Based Costing (TDABC) model. The TDABC model is considered to be able to solve problems in the ABC method with easier and cheaper implementation (Kaplan and Anderson, 2007; Tjahjadi, 2010). In general there are two steps in TDABC, namely: first, estimating the cost per unit (tarif) capacity and second, calculating the estimated time for each activity (Kaplan and Anderson, 2007; Tjahjadi, 2010).

Research on the implementation of the TDABC method has been carried out since it was introduced by Kaplan and Anderson in 2007, some of which are Bruggeman (2005), Hajiha (2011), Stout (2011) in industrial companies, and Szychta (2010) on service companies. The TDABC method with the advantages offered can be one solution for universities in analyzing their costs. This research will be devoted to calculate the unit costs of students in each study program at the Undiksha Faculty of Economics. Based on the description above, the problem in this research can be formulated, how much is the unit costs of students in each study program in Economics Faculty of Undiksha?

II. LITERATURE REVIEW

A. *The Unit of Cost*

Unit cost is the cost incurred to produce each one product unit. Calculated costs come from charging costs to cost objects such as products, consumers, suppliers and raw materials. Management needs to determine the cost per unit of product for the basis of pricing. If management knows the cost of production, they will be able to determine prices that would not cause losses to the company and can compare it to the selling price of competitor products.

The advantages of unit-based cost systems are the ease of application. The data needed is relatively simple so it does not require a sophisticated and expensive information system to get it. Although simple, this system is still sufficient to be used in businesses that produce uniform products or services (one type) or there are not many variations in the production process.

B. *Time Driven Activity Based Costing (TDABC)*

The weaknesses and problems found in ABC method are the background for Kaplan and Anderson to develop ABC method into TDABC method. TDABC method is considered to be able to solve problems in the ABC method with easier and cheaper implementation (Kaplan & Anderson, 2007). In general there are two steps in TDABC, the first is the estimated cost per unit (tariff) capacity and the second calculates the estimated time for each activity (Kaplan & Anderson, 2004; Tjahjadi, 2010; Hansen, et al., 2009).

Cost calculation begins by calculating the cost per department. Costs in each department are divided into main departments and support departments. Costs from the support departments are then allocated to the main department. Allocations can use time driven, or use other allocation bases. After the main cost per department is collected then the

estimated percentage of practical use of resources in the main department concerned (the amount of practical time). This practical capacity is used as a basis for calculating the cost per unit of the main department.

After calculating the cost per unit of capacity for activities in the company, the second step is to determine the amount of time consumed by each activity. This step can be done by interviewing or by direct observation. Unlike the ABC method which calculates based on the percentage of time for an activity. Time Driven Activity Based Costing assesses based on how long it takes to do one activity unit, for example how long it will take to do learning activities. This is the basis for calculating the cost per cost object.

III. RESEARCH METHOD

This research is a quantitative descriptive study designed to calculate the unit costs (unit costs) of each study program in Economics Faculty of Undiksha.

Research data were collected through interviews, observation, and documentation studies. The interviews were conducted with the leaders of Undiksha both at the rectorate and study programs (at the Faculty of Economics), staff in finance and student affairs at the rectorate and the Faculty of Economics. Observations are made on various campus academic and non-academic activities related to the process of determining the cost per student (unit cost). Documentation studies were carried out on various financial and student documents which contained various expenses and the number of students in each study program at Faculty of Economics of Undiksha.

Data analysis was carried out in a descriptive quantitative manner using a time-driven activity based costing analysis. The analysis phase of student unit costs with TDABC method consists of:

a. Support department cost allocation to the study program

The main department related to the cost calculation per student in a university is a study program. The cost of study programs can be categorized into direct costs and indirect costs. Direct costs are the costs incurred by the study program directly for the needs of the study program. While indirect costs are costs obtained from the allocation of support departments or other departments in universities

The costs allocation from the support departments to the study program is carried out using resources drivers in each study program. Resources driver are a trigger for costs which causes the study program to consume costs at the support departments. The formula for calculate the cost allocation rate per student from the support department can be calculated by the formula:

$$T = C : R \dots \dots \dots (1)$$

T: cost allocation rate per student from support department, C: total cost of support department, R: resource driver

After obtaining from the allocation per student, then it will be multiplied by the number of students in each study program.

b. Cost analysis per Study Program Activity

After the cost allocation to the study program, then calculate the cost rate capacity of each study program. Rates per capacity are calculated using the formula:

$$CCR = TC : TPC \quad (2)$$

CCR: capacity cost rate, TC: total cost of study program, TPC: total practical capacity of study program

Suppose the total practical capacity of the study program is 80% of the total normal capacity (100%) of the lecturer working hours in each study program. The normal capacity of working hours in one week is 40 hours, It means that the practical capacity per person is 32 hours (80% x 40 hours). Then if averaged 4 weeks a month and 12 months a year, the practical capacity for one person is 1,536 hours (32 hours x 4 weeks x 12 months). The total practical hours for all study program lecturers in a year is the practical capacity of one lecturer multiplied by the number of lecturers of the study program. Because there are practical hours for extraordinary lecturer courses, the number of practical hours for lecturers is added with the number of practical lecturers extraordinary in each study program.

After determining the cost rate capacity per study program per minute, the value of the cost rate capacity will be used to calculate the cost per activity per study program. The main activities of the study program are: Academic Activities (learning), research, community service, and support activities

Academic activities were the process of delivered and transferred knowledge in each subject in accordance with the curriculum for students. This process can be separated into: class preparation, learning process, evaluation of learning, and final project and practical work. Research is one of the academic improvement processes for teaching staff or lecturers. Research is also part of the lecturer Tri Darma in order to improve scientific quality of lecturers. Community service is a process of academic improvement and obligation for every lecturer. Supporting activities are activities other than learning activities, research and community service in a normal capacity. There are supporting activities such as guardianship services for students, administrative management, committees in supporting activities for the implementation of the academic process.

c. Cost allocation of study programs to activities

The total time for each of the main activities will be the basis for calculating the allocation of study program costs to activities. The total time of each activity is multiplied by the cost rate to get the total cost per activity in each study program. Total activity costs describe the total practical costs consumed by students in each study program.

Based on the Time Driven Activity Based Costing approach, it will be known the amount of costs per study program based on the main activity consumed by students in the study program and other than the main activities. The

calculation of the investment cost allocation is also carried out the same method so that the total cost of each study program is then allocated to the cost object namely students.

IV. RESULTS AND DISCUSSION

A. Profile of the Faculty of Economics of Undiksha

Faculty of Economics Undiksha has 5 (five) study programs namely: Economic Education Program, Management Program, Accounting Program, Accounting Diploma Program, and Hospitality Diploma Program. The number of Undiksha Economics Faculty students in 2017 were: 2,751 people. The list of Undiksha Economics Faculty students based on the study program can be seen in table 1

Table 1
Number of the Students Economics Faculty of Undiksha

No	Study Program	Number of Students
1	Economics Education Programs	411
2	Management Program	862
3	Accounting Program	1,347
4	Accounting Diploma Program	62
5	Hospitality Diploma Program	69
Sum		2,751

Source: Undiksha (2017)

B. Use Time Driven Activity Based Costing to Calculate Cost per Student on Faculty of Economics Undiksha

a. Cost Allocation of the Support Department to the Study Program

The main department in the context of cost calculation per student at the university is a study program. The cost of study programs can be categorized into direct costs and indirect costs. Direct costs are the costs incurred by the study program directly for the needs of the study program. Indirect costs are costs obtained by study programs from the allocation of auxiliary departments (other departments) found in university.

Direct and indirect costs of each study program at Faculty of Economics of Undiksha are presented in tables 2 and 3

Table 2
Direct Cost per Study Programs
On Economics Faculty of Undiksha

Study Programs	Sum of Cost
Economics Education	30,000,000
Management	30,000,000
Accounting	30,000,000
Accounting Diploma Program	40,000,000
Hospitality Diploma Program	40,000,000
Sum	170,000,000

Source: Undiksha (2017)

Table 3
Indirect Costs per Study Programs
at Faculty of Economics of Undiksha
(Allocation from Support Departments)

Study Programs	Sum of Cost
Economics Education	2,346,121,442
Management	3,887,442,169
Accounting	5,604,256,252
Accounting Diploma Program	1,074,396,357
Hospitality Diploma Program	1,100,182,925
Sum	14,012,399,146

Source: Undiksha (2017)

b. Cost Per Activity Study Program Analysis

The next step after allocating costs to the study program is calculating capacity cost rate of each study program.. The total practical capacity of the Faculty of Economics of Undiksha is 80% of the total normal capacity (100%) of the lecturer worked hours in each study program. The normal capacity of worked hours for one permanent lecturer in one week is 40 hours (8 hours x 5 working days) so the practical capacity is 32 hours (80% x 40 hours). The practical capacity of one lecturer in one year is 1,536 hours (32 hours x 4 weeks x 12 months). The normal capacity of one contract lecturer working hours in one week is 20 hours (4 hours x 5 working days). The practical capacity of the contract lecturer is the same as its normal capacity, so the practical capacity of one contract lecturer in one year is 960 hours (20 hours x 4 weeks x 12 months). The calculation of the practical capacity of each study program at the Faculty of Economics of Undiksha can be seen in table 4 while the Capacity Cost Rate of each Study Program can be seen in table 5

Table 4
Practical Capacity per Study Program
on Faculty of Economics of Undiksha

Study Programs	Total Practical Capacity per Year (Hour)
Economics Education	14,208
Management	19,200
Accounting	26,496
Accounting Diploma Program	9,600
Hospitality Diploma Program	9,600
Sum	79,104

Source: Undiksha (2017)

Table 5
Capacity Cost Rate per Study Program
on Faculty of Economics of Undiksha

Study Program	Capacity Cost Rate (Rp/Minute)
Economics Education	2,787
Management	3,401
Accounting	3,544
Accounting Diploma Program	1,935
Hospitality Diploma Program	1,979
Sum	

Source: Undiksha (2017)

c. Study Program Cost Allocation to Activities

The next step after calculating the capacity cost rate is to allocate the cost of the study program to activities. The total time for each main activity is the basis for calculating the allocation of study program costs to activities. Total cost of activities of each study program can be seen in table 6

Table 6
Total Main Activities Time per Study Program
At Faculty of Economics of Undiksha

Education Economics Education		
No.	Main Activities	Sum (second)
1	Academic	1,404,480
2	Research	184,320
3	Community Service	184,320
4	Support activities	45,120
Total Main Activities Time		1,818,240
Management Program		
No.	Main Activities	Sum (second)
1	Academic	2,388,480
2	Research	230,400
3	Community Service	230,400
4	Support activities	62400
Total Main Activities Time		2,911,680
Accounting		
No.	Main Activities	Sum (second)
1	Academic	4,025,440
2	Research	253,440
3	Community Service	253,440
4	Support activities	73920
Total Main Activities Time		4,606,240

Accounting Diploma Program		
No.	Main Activities	Sum (second)
1	Academic	269,600
2	Research	115,200
3	Community Service	115,200
4	Support activities	24000
Total Main Activities Time		524,000
Hospitality Diploma Program		
No.	Main Activities	Sum (second)
1	Academic	278,560
2	Research	115,200
3	Community Service	115,200
4	Support activities	24000
Total Main Activities Time		532,960

Source: Undiksha (2017)

The next step is the total time of each activity multiplied by the cost rate capacity to get the total cost per activity in each study program. Total activity costs describe the total practical costs consumed by students in each study program.

Based on the time driven activity based costing approach it will be known how much the cost per study program is based on the main activity consumed by students in the study program and other than the main activities. For the investment costs the same method is also carried out so that the total cost of each study program is then allocated to the object of the fee, namely the student. The calculation of the cost per student of each study program at the Faculty of Economics of Undiksha can be seen in table 7 and the Single Tuition Fee (UKT) for each study program at the Faculty of Economics of Undiksha is presented in table 8

Table 7
Cost per Student Each Study Program
at the Faculty of Economics of Undiksha

Economics Education	
Explanation	Sum
Total Main Activity Costs	5,067,988,752
Investment Costs	223,999,613
Total cost	5,291,988,364
Number of Students	411
Cost per student / year	12,875,884
Cost per student / semester	6,437,942
Management Program	
Explanation	Sum
Total Main Activity Costs	9,901,335,083
Investment Costs	126,445,335
Total cost	10,027,780,418

Number of Students	862
Cost per student / year	11,633,156
Cost per student / semester	5,816,578
Accounting Program	
Explanation	Sum
Total Main Activity Costs	16,324,939,940
Investment Costs	197,589,172
Total cost	16,522,529,112
Number of Students	1,347
Cost per student / year	12,266,169
Cost per student / semester	6,133,084
Accounting Diploma Program	
Explanation	Sum
Total Main Activity Costs	1,013,791,130
Investment Costs	9,094,676
Total cost	1,022,885,806
Number of Students	62
Cost per student / year	16,498,158
Cost per student / semester	8,249,079
Hospitality Diploma Program	
Explanation	Sum
Total Main Activity Costs	1,054,985,923
Investment Costs	10,121,494
Total cost	1,065,107,418
Number of Students	69
Cost per student / year	15,436,339
Cost per student / semester	7,718,170

Source: Undiksha (2017)

Table 8
Single Tuition Rate
Faculty of Economics of Undiksha

No.	Study Programs	Single Tuition
		Group I
1	Economics Education	500,000
2	Management	500,000
3	Accounting	500,000
4	Accounting Diploma Program	500,000
5	Hospitality Diploma Program	500,000
No.	Study Programs	Single Tuition
		Group II
1	Economics Education	1,000,000
2	Management	1,000,000
3	Accounting	1,000,000
4	Accounting Diploma Program	1,000,000
5	Hospitality Diploma Program	1,000,000
No.	Study Programs	Single Tuition
		Group III
1	Economics Education	2,450,000
2	Management	2,500,000
3	Accounting	2,600,000

4	Accounting Diploma Program	2,850,000
5	Hospitality Diploma Program	3,000,000
Group IV		
No.	Study Programs	Single Tuition
1	Economics Education	2,950,000
2	Management	3,000,000
3	Accounting	3,100,000
4	Accounting Diploma Program	3,350,000
5	Hospitality Diploma Program	3,500,000
Group V		
No.	Study Programs	Single Tuition
1	Economics Education	3,450,000
2	Management	3,500,000
3	Accounting	3,600,000
4	Accounting Diploma Program	3,850,000
5	Hospitality Diploma Program	4,000,000

Tables 7 and 8 show that the average tuition fee per student per semester for each study program are lower than tuition fees paid by students per semester. Based on the results of the calculation of the cost per unit of students per study program, the leaders of the Economics Faculty of Undiksha can review how to determine the right tuition fee to cover all costs incurred by each study program. In addition, the assumption that Economics Faculty of Undiksha sets the same amount of tuition at each level can still cover all costs, it should also be thought of by faculty managers. The results of unit cost calculation per student in this study indicate that each study program had a different unit cost, this can be taken into consideration in determining the different tuition fees in each study program. So that the tuition fees paid by students can cover all costs incurred by the university.

V. CONCLUSION

The results of this study showed that tuition fees for the students Economics Education program, Management program, Accounting program, Accounting Diploma program and Hospitality Diploma program are lower than the unit cost per student. Thus, in order to cover the unit cost per student on every study programs, Economics Faculty of Undiksha should recalculated the unit cost per student to set reasonable tuition fees.

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