

Cost per Student Using ABC Approach: A Case Study

Ruhanita Maelah¹⁺, Amizawati Mohd Amir¹, Azlina Ahmad¹ and Sofiah Md Auzair¹

¹ Universiti Kebangsaan Malaysia

Abstract. Activity Based Costing (ABC) has become a popular cost and operations management technique to improve the accuracy of product or service costs. This study uses a single case study method to determine the cost per student for all academic programs at a public university in Malaysia, using ABC approach. Findings from this study indicate that at present, traditional costing method is being used and the number of students is the sole cost driver in allocating the costs. The cost per student is averaged by faculty. The study shows that using ABC, a more comprehensive and detailed cost information can be generated at the program level for undergraduate and graduate; and for international and local students. The ABC model produce higher annual cost per student compared to present but lower annual cost per student for graduate programs. This study contributes significantly to the theoretical knowledge by providing an empirical evidence of ABC application in a service setting. In practice, it benefits interested parties including management, Ministry of Education, other institute of higher learning, sponsors, students, parents and the general public.

Keywords: Activity Based Costing, university, service, student

1. Introduction

ABC is recognized as a strategic management accounting tool that is able to improve traditional costing of indirect costs. In 2010 the Ministry of Higher Education (MOHE) of Malaysia proposed use of ABC to determine cost per student for academic programs at institutes of higher learning (IHLs). The information is expected to provide more accurate information on cost, price, and utilization of resources which can be used to make sound planning, decision making, controlling and continuous improvements. Universiti Kebangsaan Malaysia (UKM) has been selected as a pilot study. In the long run UKM is expected to continuously using the system for various other purposes.

In recognition that studies on ABC implementation in service organization is scare, this study adopts a single case study approach to document the determination of cost per student for all academic programs offered at UKM. UKM is an established public university founded forty years ago. The university has a main campus an a medical campus. It now has 12 faculties, a Graduate School of Business and 14 research institutes. UKM is a home to more than 2,500 academics, 700 supporting staff and a student population of approximately 28,000.

2. Literature Review

2.1. ABC

In the 1980s traditional costing methods were criticized for lack of relevance, accuracy, and timeliness. ABC was introduced during this period to ensure overhead cost is determined not only based on volume of output, but also the variety and complexity of outputs (Mitchell, 1996). ABC popularity can be traced to several US organizations through series of case publications by Harvard Business School (Cooper 1988a,b,

⁺ Corresponding author. Tel.: + (60389213956); fax: + (60389213162).
E-mail address: (ruhanita@ukm.my).

Cooper 1989, Cooper and Kaplan, 1988). Since then, ABC received tremendous attention among researchers and businesses. Comprehensive research on ABC among developing countries, especially in Asia region is still limited. Most research use survey method to determine management accounting tools including ABC among manufacturing organizations (Nimtrakoon and Tayles, 2010; Maelah and Ibrahim, 2007; Maelah and Ibrahim, 2006; Ghosh and Chan, 1997).

2.2. ABC in Service Sector

Many service organizations reevaluate their costing systems and use ABC to remain competitive in the marketplace. Service industries being studied for ABC application include health (Barnett 2009, Azoulay, Doris, Fillion et al 2007, Ross 2004, and Udpa 1996) restaurant (Raab 2009, 2005), hotel (Pavlatos and Paggios, 2007), financial (Rafiq and Garg, 2002), insurance (Qiao and Chen, 2007). Several studies on service organizations were limited to development of model without empirical evidence or calculation of costs (Qiao dan Chen, 2007; Popesko, 2009). There are several studies on ABC application at IHLs including Ismail (2010), Granaof, Platt and Vaysman (2000), Krishnan (2006) dan Whelan (2003). However these studies are not comprehensive, use of ABC for specific segment within the organization such as faculty (Ismail, 2010; Granaof, Platt and Vaysman, 2000; Whelan, 2003), support services (Krishnan, 2006), or central overhead (Goddard and Ooik, 1998). The determination of cost for library services is evident in Belgium (Ching, Leung, Fidow and Huang, 2008), and Australia (Ellis-Newman and Robinson, 1998). In summary, past studies indicate that ABC is widely recognized as a superior method for allocating overhead costs. In the past, much emphasis has been placed on the implementation of ABC in the manufacturing industry. Examples that demonstrate the use of ABC in service organizations especially the IHLs have been incomplete and scarce.

3. Methodology

This study use a case study method. Over the past two decades, a succession of authors has called on researchers to study accounting in its practical setting. Initially most of the attention has been directed to the design of ABC. After ABC had been practiced for many years, case studies were widely used to identify the difference between ABC and the traditional costing system. Artemis and Kaplan (1987), Cooper and Kaplan (1988a, 1988b), Bhimani and Pigott (1992), Greeson and Kocakulah (1997), and Wang et al. (2005, 2010) took this approach. Actual 2008 and 2009 financial data were used in this study. In the first phase, analysis on the present cost per student data is performed to understand how cost per student is determined and how it can be improved in the proposed calculation using ABC. In the second phase, SAS ABM Select Edition software is used to determine the cost per student for each academic program offered by the faculties. Assumptions are used sparingly in situations where actual data is still not available. Representatives from interested parties provide data and feedback for this study during interview and feedback sessions.

4. Analysis

4.1. Cost per student – present approach

Prior to the introduction of ABC, cost per student is traditionally determined using number of students as the sole cost driver. In the university's financial system costs are collected at sixty one responsibility centers under four categories. Excel software is used and cost per student is using the following formula:

$$\text{Cost per student} = \frac{\text{Faculty cost}}{\text{Number of students per faculty}} + \text{Administrative cost per student}$$

The faculty cost is divided by the number of students in that faculty. The average administrative cost per student of RM6,496 is added to arrive at the annual cost per student. Average cost per student for 2009 is shown in Table 1. As a public university, the annual fee being charged to students is determined by MOHE. Therefore the difference between cost and fee is regarded as contribution by government.

4.2. Cost per student – ABC approach

Four critical steps were performed in ABC approach; (1) improve data quality, (2) develop ABC model for cost per student, (3) identify assumptions and (4) apply 'SAS Activity-Based Management – select Edition' software. Data quality improvement include tracing of general cost to related responsibility centers,

excluding cost of asset purchases, including depreciation expense, categorizing responsibility centers according to its main roles, using various cost drivers, and detailing the cost according to student categories.

Fifty eight responsibility centers and are categorized as follow: Infrastructure – provide services to UKM staffs, students, community and public. Eight infrastructure responsibility centers include academic museum, Islamic center and publisher. Institutional support – provide services to all staffs and students. Eight institutional supports include bursary, registrar, Information Technology and health center. Academic support – provide services to institutes and faculties. Sixteen academic supports include library, center of academic development, center of graduate management, and student development. Institute – research in specific areas of expertise. Faculty - manage graduate and undergraduate programs, and other activities related to teaching and learning. There are fourteen institutes and twelve faculties respectively. Clinical cost is charged to four faculties that impose clinical requirements on their programs.

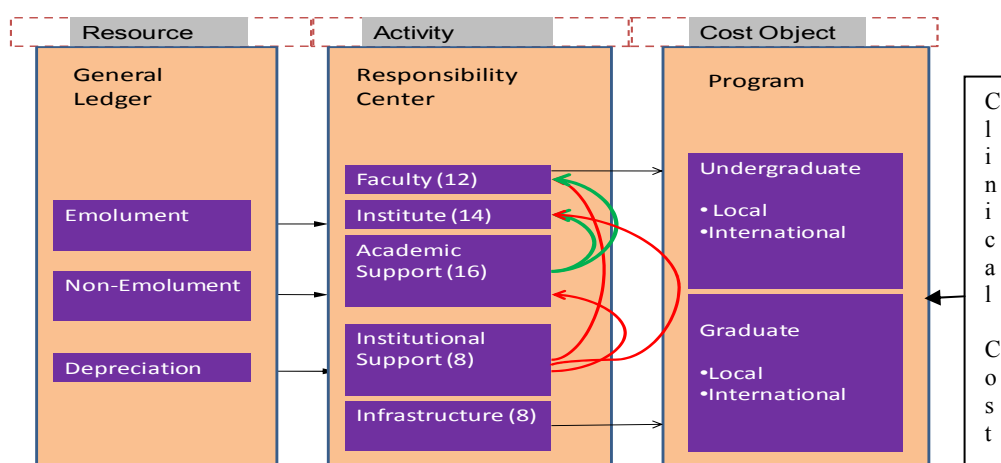


Fig. 1: ABC Model

Figure 1 shows the ABC model indicating the cost flows to determine cost per student per program. Examples of various cost drivers include number of transactions, number of students, number of staffs, credit hours, weighted costs, percentage of activities, duration of academic programs.

No	Faculty	Based on number of students	ABC Undergrad. 2009	ABC Graduate 2009	ABC Undergrad. 2008	ABC Graduate 2008
1	Economics and Business	RM15,174	RM15,663	RM7,170	RM15,760	RM8,294
2	Engineering	18,343	35,945	16,787	34,494	16,108
3	Education	11,281	13,102	8,159	12,938	8,052
4	Islamic Studies	14,131	17,054	9,821	16,783	9,660
5	Dentistry	47,091	113,843	56,764	104,277	52,000
6	Medical	34,296	68,322	31,500	66,558	30,680
7	Allied Health Science	18,876	32,993	20,603	32,588	20,343
8	Pharmacy	17,975	26,600	12,757	18,784	9,061
9	Science and Technology	16,866	24,840	12,241	24,843	12,235
10	Social Science Humanity	15,668	24,192	12,670	24,338	12,738
11	Info. Science Technology	14,807	19,303	9,737	18,764	9,462
12	Law	14,024	18,256	8,479	17,996	8,352

Table 1: Comparison of annual cost per student

Annual cost per student per program is determined using ‘SAS Activity-Based Management – Select Edition’ software. Table 1 shows a comparison of average annual cost per student for each faculty (exchange rate RM1 = USD0.33 = GBP0.20). Data gathering is a challenging process as it involves various parties within the organization. Kaplan and Anderson (2004, 2007) note that the procedure for estimating ABC model has proved to be difficult especially if the current accounting system does not support the collection of

the needed information. According to Kaplan and Anderson (2007) updating ABC model through interviews and surveys further increase its time and resource consumption. Therefore, in situations where actual data is unavailable, assumptions are used in the model.

5. Findings and discussion

At present UKM uses traditional costing method using number of students as the sole cost driver to determine the cost per student. However there is a growing concern that the data is inaccurate and lack details thus implying the need for a more sophisticated costing method. ABC system identifies costs, services and products at a much finer level (Barnett 2009; Ross 2004; Udpa 1996). Using ABC approach, annual cost per student is higher with small difference for social science faculties – Economics and Business, Education, Islamic Studies, and Law. Faculty of Social Science and Humanity records a large increase, similar to all science faculties – Engineering, Dentistry, Medical, Allied Health Science, Pharmacy, Science and Technology, and Information Science Technology. There is a possibility that the annual cost per student was understated under traditional costing method, as ABC approach is expected to produce a more accurate cost because multiple cost drivers were used (Everaert, Bruggeman, Sarens et al, 2008). The increase could also due to the higher base cost as ABC uses automated data collection, handles overhead expenses and includes all costs of the enterprise (Barnett 2009; Azoulay, Doris, Filion et al 2007). In this case, the 2008 and 2009 the operational cost under ABC approach takes into account depreciation expense and the clinical costs.

Cost for graduate programs could be significantly understated because research fund is not considered in this model. At UKM, research fund is managed separately from operational fund since 2008. It is managed according to research niche as the research projects are cross functional in nature. Research cost for graduate students in science faculties is high due to high cost of equipment and materials. Research cost is significant to determine cost per student for programs offered through research mode (Whelan, 2003). Emolument expense represents about 60 percent of total annual operational cost at UKM. However, emolument expense of academic and non-academic staffs is not traced to their actual workload. Graduate students are taught and supervised by professors, associate professors and senior lecturers. Their class size is small and supervision is one-to-one basis. This practice varies across faculties and has not been systematically captured in the ABC model.

6. Conclusion

This study contributes significantly to the theoretical knowledge by providing an empirical evidence of ABC application in a service setting or more specifically at a university. Practically, this study contributes significantly to interested parties including management of UKM, MOHE, other IHLs, sponsors, students, parents and the general public. Costs per student information can be used to improve accountability, and determine fees, sponsorship amount, education investment, and government contribution. Future research should aware that the finding is case specific, subject to changes in model and use little non-financial and qualitative information.

7. Acknowledgements

We acknowledge the financial assistance and support of MOHE Malaysia and UKM (EPGL005-2010).

8. References

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