Governance Based on Cost Analysis: Unit Cost Analysis for Vocational Schools

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ABSTRACT

This research is encouraged by the desire to provide adequate theoretical studies in establishing the policy the policy of providing financial support for students to be able to follow education at various levels of education (in Indonesian terms known as Bantuan Operasional Sekolah abbreviated BOS) especially in vocational schools (in Indonesian terms known as Sekolah Menengah Kejuruan abbreviated as SMK). The policy of providing BOS funds that have been implemented is to provide the same amount of funding for each student throughout Indonesia. According to the researchers, the policy is not good because according to the researchers there are various characteristics that should affect the amount of BOS funds received by each student such as economic capacity, cost standards for each region, and type of department. Based on the mentioned conducted research in two stages. The first stage has been completed by concluding that the variables of school tuition, school facilities, economic capacity of the community, and learning outcomes are interconnected with each other. These results conclude that the policy of providing BOS funds will be more effective when considering the variables of related variables so that the amount given for each student is not the same. It concludes that unit cost calculations are required to conduct the learning process for each student as a basis for establishing education funding policies.

Keywords: BOS, cost of education, unit cost, vocational school.

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The specific purpose of this study is to obtain the cost of providing education in vocational schools by meeting national education standards coupled with local content. Once these objectives can be achieved, the results can be used for various purposes such as inputs to the government that the allocation of equitable BOS funds across Indonesia needs to be reviewed. Government needs to pay attention to several variables in the establishment of BOS funds per region as; unit cost to produce one vocational school graduate for each region and community capability in the area. The government can then assign BOS funds based on the nature of the matter. This research is to be focused on an education financing framework to be able to carry out the learning process according to national standards of education. In other words, it can be said that this research will try to determine the amount of cost needed to produce one graduate. This study is devoted to calculate the structure and the amount of costs in Vocational High School in North Sumatra.

As an effort to determine the amount of cost to produce something so this is also an attempt to calculate the cost of production. In the study of accounting, the calculation of cost of production becomes a study discussed in an accounting specialization that is cost accounting and management. In a public context, the cost of production refers to the amount of costs required to produce a unit of goods. Determination of the production price of one unit of goods will be a reference to the determination of the selling price. The concept can also be applied in educational institutions where graduates of a school can be viewed as a product of the process being carried out. In order to produce the product is certainly required cost in accordance with the standard process set.

2. Literature review

2.1 Activity based costing (ABC)

In calculating the cost of production there are several methods but the most common is the traditional method and Activity Based Costing (ABC) method. The traditional method imposes the cost of producing goods in units using direct working hours. In traditional cost systems, the cost drivers used are based only on the units, as measured in direct working hours, or materials cost. Unit-based activity triggers are factors that cause cost changes when the number of units generated changes.

A more recent and comprehensive approach is the Activity Based Costing (ABC) method. The ABC method is based on the assumption that a product absorbs a variety of overhead resources or has many cost drivers. The cost structure of each product is also not the same where one product can absorb more costs than other products. CIMA (Chartered Institute of Management Accountants) defines ABC as an approach to costing and observing activities that involves tracking activities that use resources in a series of processes to produce final output. Activity is a collection of actions performed within an organization that are useful for purposes of activity-based costing.

The Activity Based Costing method in 1980 has been widely challenged due to its less relevant method, less accurate, and less timely. At that time, then introduced a new method is the method of financing Activity Based Costing (ABC). Krishnan (2007) stated that Activity Based Costing (hereinafter abbreviated ABC) was first developed by Cooper and Kaplan, a board system designed to reduce the risk of inconsistent and volatile cost allocations that is very close to traditional boarding systems and is expected to provide accurate in better cost allocation. Various researchers globally have conducted testing on Activity Based Costing, Rogers & Bangert Jr (1998), Capps & Timlin, (1998), Ip, Li, & Yau (2002), Krumwedie (1998), Krumwedie & Tyson (1997), and Sarrakeh, Ebrati, Khamghal, & Ebrati (2012) stated that ABC besides giving better accuracy in determining the funding of a product, can also improve the basis of strategic policy, resource allocation used, product mix, price, and marketing. Furthermore, based on the costing method based on ABC is then highly beneficial for the complex manufacturing industry, individual with different product costs, and different industrial environments. ABC, then provides new findings in allocating overhead costs on which ABC can facilitate the identification of how individual customers affect the cost of supply. Ruhapaty and Magaud (2014), stated that ABC can solve the problem of inaccurate accumulation of the cost of doing traditionally by separating it based on each type of activity on each
cost object. The ABC method focuses on the allocation of overhead costs to each activity-based cost group by using controlling resources and then allocates the costs that are in the activity-based cost group to the product using the activity cost controller. The following figure below will give you a clear picture of the costing flow based on the explanations given earlier. ABC is a more accurate costing method than the traditional way, so it will impact on the better state of using it for managerial decision making such as pricing strategies in business contexts that produce varied products and also determine the cost of production in a complicated mechanism of activity. Cooper and Kaplan in Coskun and Yilmaz (2013) stated that ABC is actually designed originally to be used in business enterprises and manufacturing industries that produce finished products, but then, ABC is widely accepted in the context of service enterprises which then provide excellent benefits.

2.2 Implementation of activity based costing on service sector

ABC is a very useful decision-making framework within the context of economic analysis in the service sector, particularly in the planning, controlling, and decision-making sections. Cooper and Kaplan in Krishnan (2007) argue that service firms can benefit from the use of ABC in their business operations as well as manufacturing companies have felt, as in the context of analyzing operational expenses and carrying out service activities that require different types and forms of resources.

In addition, ABC can be an effective tool in service companies in terms of tracking the costs incurred on services that have been generated and tools that are very helpful in implementing total quality thinking in service companies used by management in analyzing and delivering their value to customers. An example that can be stated is how ABC systems in hospitals can help managers better perform operational efficiency assessments, establish more comprehensive comparisons to analyze hospital performance with other hospitals, and optimize the range of services provided to patients in the hospital.

Many studies have proven that ABC can provide information that enhances a manager's ability to identify cost-saving opportunities and leverage them to improve the preparation of better business strategies. Thus, the ABC-based costing system will be able to help the service sector to understand the cost and value of the essential activities services in controlling the increase in operational costs.

Mühlab, Amir, Ahmad, and Auzair (2011) states that today many service organizations are revolting their financing system and using ABC as a new system that is more competitive in the market today. A lot of research in the service sector is limited to the development of costing methods without any empirical conclusions about the cost calculations. ABC is the most widely recognized method or costing system that best fits in allocating overhead costs. If in the past the use of ABC in manufacturing companies has been widely used, but now its use in the service sector is increasingly needed especially in the education subsector although it is believed that the use of ABC in the service sector especially educational organizations is not comprehensive.

Ruhupatt and Maguad (2016) stated that there has been a lot of research that studies the benefits of ABC applications in the service sector. Vazakidis, Karagiannis, & Tsapelas (2010) examine the application of ABC in the public sector, especially to measure the cost of services performed by public offices. Krishnan (2007) argues that educational institutions face the challenge of staying competitive and feeling the benefits of improving quality, improving efficiency and eliminating activities that create non-value-added costs to the organization. Managers of educational organizations need financing information to be able to determine managerial decisions that will enable them to improve quality efficiency, and eliminate activities that generate non-value added costs.

This study shows that the application of the ABC system will be able to help educational organizations to improve operational performance and improve the quality of services provided on the needs of their customers.

Coskun and Yilmaz (2013) argue that the allocation of costs to the service sector is often more complicated than that of manufacturing or trading companies. The fact that the resulting form is not a product that is physically visible, the service company will be more careful in determining the cost object and allocating costs to the right conditions and ways. ABC has become a new way and approach of cost allocation methods that divide indirect costs on service companies based on their respective activities.
Survey of vocational schools in North Sumatera region which is a sample of research studies to obtain an overview of the learning process, the condition of educational facilities and the contribution of community in the form of tuition fee paid to schools.

2. Analysis of linkages between variables such as learning outcomes, learning processes, educational facility conditions, tuition paid by the community, and economic capacity of the community.

3. Drafting educational activities ideal according to national standards of education as reference materials for phase 2.

Phase Two (January to May 2018)

This second phase is the most complicated stage because it requires a deep and detailed understanding. The second phase cost allocation has the following sub-stages:

1. Identify and Define Activity

The most important step in the implementation of the Activity Based Costing (ABC) system is to identify the activities on which the system is based. If applied in the vocational school, it must be determined the activities that must be done to produce SMK graduates. This will be divided into several things that may affect the relationship of both things.

2. Calculating Activity Rates

The activity tariff will be used for the overhead cost to each student. The team will determine the total activity that should really happen (ideal version according to educational standards) and the real thing happened.

3. Result and discussion

In the first stage survey and analysis of preliminary data have been conducted to provide an initial description of the issues to be studied. The results are summarized in Table 1. After performing tabulation of survey data then conducted correlation analysis to know the relationship between various variables above. This is done to obtain an overview of the research issues to be analyzed further. The results of the data correlation calculations are presented in Table 2.

4. Discussion

Based on the results of correlation analysis that has been done and displayed in Table 2 can be found various interesting analysis. If we look at the relationship between the economic capacity of the community and the learning outcomes of the vocational school students in the school, the relationship is quite weak at 0.12. This means there is no strong direct link between the two. This result is quite interesting because the initial guess of the researchers there is a strong relationship between economic

Governance based analysis of vocational schools in North Sumatera region which is a sample of research with student achievement. This fact at the same time makes it necessary to do a more in-depth analysis of some of the things that may affect the relationship of both things.

Table 1: Recapitulation of survey result data

| No | Region                        | Number of 12th Graders | Average Income (IDR) (Person/Year) | Average Tuition Fee (IDR)* | Quality Level of Education Facilities* | Average National Exam% |
|----|-------------------------------|------------------------|------------------------------------|-----------------------------|----------------------------------------|------------------------|
| 1  | Medan City                    | 16,381                 | 74,471,410                         | 347,500                     | 7                                      | 66,68                  |
| 2  | Pematang Siantar City         | 3,518                  | 42,704,180                         | 225,700                     | 6                                       | 71,44                  |
| 3  | Binja City                    | 2,387                  | 31,914,700                         | 252,450                     | 5                                       | 69,12                  |
| 4  | Teping Tinggi City            | 1,703                  | 27,448,570                         | 215,000                     | 7                                       | 61,18                  |
| 5  | Tanjung Balai City            | 680                    | 36,085,130                         | 215,000                     | 5                                       | 57,91                  |
| 6  | Siak City                     | 1,078                  | 44,235,000                         | 175,000                     | 5                                       | 52,46                  |
| 7  | Pagsandang Simpalese City     | 2,197                  | 21,088,780                         | 195,500                     | 5                                       | 68,47                  |
| 8  | Gumukguliat City              | 1,528                  | 26,225,260                         | 175,000                     | 5                                       | 59,76                  |
| 9  | Regency of Deli Serdang      | 9,618                  | 32,871,000                         | 275,000                     | 5                                       | 63,31                  |
| 10 | Regency of Langkat            | 5,158                  | 29,950,800                         | 250,000                     | 5                                       | 62,19                  |
| 11 | Regency of Simalungung        | 3,330                  | 32,066,520                         | 235,000                     | 4                                       | 75,62                  |
| 12 | Regency of Karo               | 1,958                  | 24,447,890                         | 165,000                     | 3                                       | 56,40                  |
| 13 | Regency of Deli               | 1,958                  | 37,599,550                         | 219,500                     | 5                                       | 57,97                  |
| 14 | Regency of Asahan             | 3,066                  | 52,215,100                         | 272,500                     | 6                                       | 81,30                  |
| 15 | Regency of Labuhanbatu        | 2,226                  | 19,864,750                         | 160,500                     | 5                                       | 71,84                  |
| 16 | Regency of Tapanul Utara     | 2,047                  | 20,399,800                         | 170,500                     | 5                                       | 57,10                  |
| 17 | Regency of Tapanul Timah      | 1,632                  | 36,715,930                         | 190,000                     | 4                                       | 67,72                  |
| 18 | Regency of Tapanul Selatan   | 1,053                  | 16,615,050                         | 145,000                     | 4                                       | 58,39                  |
| 19 | Regency of Nias               | 865                    | 31,350,000                         | 175,000                     | 5                                       | 53,52                  |
| 20 | Regency of Toba Samoset       | 1,619                  | 23,143,400                         | 185,000                     | 4                                       | 47,16                  |
| 21 | Regency of Mandailing Natal   | 1,050                  | 23,276,370                         | 185,000                     | 5                                       | 49,16                  |
| 22 | Regency of Hambung Hasudutan  | 1,458                  | 24,492,560                         | 179,500                     | 5                                       | 53,62                  |
| 23 | Regency of Pakpah Bharat      | 284                    | 18,217,460                         | 152,500                     | 5                                       | 78,28                  |
| 24 | Regency of Nilas Selatan      | 1,805                  | 15,356,000                         | 150,000                     | 2                                       | 66,89                  |
| 25 | Regency of Samosir            | 785                    | 25,995,500                         | 219,000                     | 5                                       | 76,00                  |
| 26 | Regency of Sirtang Bedagai    | 2,488                  | 33,130,250                         | 275,000                     | 5                                       | 68,15                  |
| 27 | Regency of Ratu Baha          | 1,066                  | 62,231,180                         | 327,500                     | 4                                       | 57,17                  |
| 28 | Regency of Padanggamar Utara | 437                    | 32,400,850                         | 205,000                     | 3                                       | 70,03                  |
| 29 | Regency of Padanggamar        | 1,059                  | 30,631,140                         | 287,000                     | 5                                       | 73,12                  |
| 30 | Regency of Labuhanbatu Utara | 1,529                  | 50,091,020                         | 245,000                     | 5                                       | 67,95                  |
| 31 | Regency of Labuhanbatu Selatan| 1,059                  | 67,502,780                         | 250,000                     | 5                                       | 76,98                  |
| 32 | Regency of Nias Utara         | 1,010                  | 18,769,630                         | 165,000                     | 2                                       | 69,52                  |
| 33 | Regency of Nias Batar         | 449                    | 14,993,100                         | 132,500                     | 5                                       | 73,61                  |

Note:
1. An autonomous region of government that may take the form of a city or a district. North Sumatera Province region is divided into 33 autonomous regions
2. The number of 12th graders that takes the national exams in 2016
3. Average income per person for each region according to 2016 BPS data
4. Average tuition fees earned by taking a random sample of 15 vocational schools per each region.
5. The quality of infrastructure facilities as measured by the data provided by the researchers with a range of 1-5.
6. The value of national examination in 2016 obtained from the Ministry of Education and Culture.

Journal of Arts and Humanities (JAH) 39

Governance based on cost analysis...
A stronger relationship is shown between the amount of tuition paid by the community and the national examination score of 0.30 at the moderate level. This relationship cannot be analyzed individually. School fees paid by the community are used by schools to provide the necessary equipment in the learning process. The high school fees paid by the community ensures that the school has the ability to provide learning facilities such as laboratories, internet, and so forth. Based on the results of correlation analysis it is evident that there is a strong relationship between the amount of school fees paid with the quality of educational facilities owned by the school that is equal to 0.69. This relationship can be said to be very strong thus providing clear evidence that vocational schools do require substantial costs to support the implementation of quality education processes.

Furthermore, the results of the analysis also show a moderate relationship between the quality of educational facilities and learning outcomes of 0.28. Theoretically, this relationship should be strong enough but it should be suspected that many factors affect the value of the national exam in addition to the student's ability. It has become a common concern that the results of national examinations are not entirely valid as a measure of student learning outcomes. Nevertheless, the value of the national exam is still quite feasible to be used to analyze the problems studied. This moderate relationship shows that the quality of educational means has a relationship with the learning outcomes so that schools need to give good care to provide adequate means.

The strongest relationship between the relationships analyzed is between the incomes of the community and the fees paid. This is clear evidence that schools are applying for school fees according to the community's capacity around the school not on the basis of the ideal standard of education to be met. This strong relationship indicates that the government needs to intervene specifically in areas with a fairly weak economy. Allowing schools to adapt to the economic capacity of the community is very dangerous because it certainly will sacrifice the quality of learning.

The above results also show strong empirical evidence that the policy to provide equitable boss funds across the entire territory of Indonesia is urgently needed to be evaluated. The government should consider various special characteristics: factors to be able to channel the boss funds more optimally. This result also concludes that research on unit cost is required to produce a graduate of vocational schools. The results to be obtained will be used as an academic appraisal to evaluate the BOS fund policy. This research will be continued at the second stage to calculate the unit cost based on region characteristic and department in vocational school. These results are integrated with the economic capacity data of the community can be a good rational basis to specify the boss funds discharged by the government.

5. Conclusions and policy implementation

5.1 Conclusions

Based on data analysis and discussion that has been submitted in the previous section, then the following conclusions are generated:

1. The economic ability of the community has a weak correlation with learning outcomes as measured by the national exam results. This relationship has a contradiction with other relationships so that it will be evaluated further in the second phase of the study.

2. The amount of tuition fees paid has a moderate correlation relationship with the learning outcomes as measured by the national test scores. This indicates that the funds obtained by schools to run the learning process will affect the learning process. The relationship between the tuition fees is likely to not directly affect the learning outcomes but the tuition received by the school is used to provide adequate educational facilities. This is supported by the analysis of the relationship between the quality of educational facilities and learning outcomes.

3. The quality of learning support facilities has a strong relationship with student learning outcomes. These results provide recommendations that improved learning facilities are needed to improve learning outcomes.

4. The economic ability of the community is strongly correlated with the tuition paid so that regions with better levels of economy will be more flexible to implement high school fees. This provides a very strong indication that schools make adjustments to the size of school fees with the economic capacity of the community. This is not very good because it is likely that schools will sacrifice quality to be able to reduce the amount of tuition.

5. The amount of fees paid has a strong relationship with the quality of education facilities owned by the school. This is quite rational because school fees received by schools are a source of pensions for the purchase of educational facilities.

5.2 Policy Implementation

Based on the results of research that has been submitted above, here are the various policy implications suggested:

1. The government needs to pay attention to the community's ability to implement BOS funding policy so that the amount of aid given is not the same between one region and the other. This is due to differences in tuition fees between regions which is a picture of the economic capacity of the community either directly or indirectly affect the learning outcomes.

2. Provision of funding for educational facilities needs to be integrated with BOS funds in order to have an optimum combined effect whereby areas receiving small facility assistance can be offset by the relatively large provision of BOS funds. This will have an impact on the use of more efficient and effective education funds.

3. The government through the education office needs to calculate the unit cost required to provide one student's education. The unit cost can be used as a governance instrument to create strategic policies. This research will develop a cost calculation guide that will be implemented in the next stage of research.

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