

## Conference Paper

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

Chandra Situmeang and Muhammad Ridha Habibi

Faculty of Economics, Universitas Negeri Medan, Medan, Indonesia

## Abstract

This study aims to calculate unit cost to produce one middle-level vocational school graduate (in Indonesian terms known as 'Sekolah Menengah Kejuruan' abbreviated as SMK). The calculation is required because operational grant funds (in Indonesian terms known as antuan Operational Sekolah abbreviated as BOS) are distributed so far to the same extent in all areas of Indonesia and for all majors. This is most likely less than optimal because in fact there are very basic characteristics differences including; Economic capacity of each region, the cost standard for each region, and the type of department in the school. Based on this, the researcher assumed that cost analysis should be done by considering these things as a basis to provide BOS funds tailored to specific characteristics. The data to be analyzed in this research is North Sumatra province data. This research is conducted in two stages, which in this report only completed the first phase which is a survey in North Sumatra region. Stages of survey to obtain data which then analyzed with related data such as community income, learning outcomes through the value of national examinations, tuition fee, and conditions of learning facilities. The research is funded by the ministries of research, technology and higher education through competing grant schemes for fiscal year 2017 and 2018. The result of correlation analysis between the variables shows that there is a strong relationship between the average income with average tuition paid by the community and between average tuition paid by the community with Quality Level of Education Facilities. The result of correlation analysis also shows a moderate relationship between the average tuition with learning outcomes measured through average national exam and relationship between quality level of education facilities with average national exam. While the relationship between average income with average national exam does not have a strong relationship. The result of correlation analysis concludes that further research is required to calculate unit cost. The results of these calculations can be used as a recommendation for policy makers to evaluate the funding system boss funds to pay attention to the characteristics as mentioned earlier.

**Keywords:** component; vocational school; unit cost; unit analysis

Corresponding Author:

Chandra Situmeang  
chandrasitumeang@gmail.com

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## 1. Background

Education is a very important part in nation building. Indonesia also believed about the importance of education by provides the rule of law to ensure the good implementation of education development. Various regulations are very clearly stated in various levels of the rules, for example the rules on the allocation of 20% from the country total budget to the education sector is regulated in the Undang Dasar (Indonesian Basic Constitution). Another rule on compulsory education for children aged 7–15 years is stipulated in Undang-Undang Nomor 20 Tahun 2003 (Indonesian Constitution) about National Education System. The rules are still followed by many rules under it which aims to ensure the implementation of a quality education system. Especially about funding, government response to the economic incapacity of society that is not sufficient to bear the cost of high quality of education by provides education operational grants.

The operational support is channeled to education ranging from early childhood education to undergraduate level with various names. The pre-school level is provided Operational Aid for Early Childhood Education (known by the term in Indonesian, *Bantuan Operasional Pendidikan Anak Usia Dini*, hereinafter abbreviated as 'BO PAUD') and for primary to secondary level education is provided of Provisional School Operational Assistance (known by the term in Indonesian, *Bantuan Operasional Sekolah*, hereinafter abbreviated as 'BOS') for higher education is provided of Operational assistance of state universities (known by the term in Indonesian, *Bantuan Operasional Perguruan Tinggi Negeri*, hereinafter abbreviated as 'BOPTN'). BO PAUD and BOS are distributed based on the number of students enrolled in each school both public and private schools while BOPTN is distributed using a variety of indicators. The huge amount of BOS funds made this budget item a concern to many education stakeholder. As an impact of the calculation of the distribution of BOS funds based on the number of students, the school tried to get a large number of students in order to obtain a relatively large BOS funds.

The basic concept of the distribution of BOS funds is to Cover the shortage of total education expense that cannot be borne by the payment of tuition received by students. That is, with the help of BOS funds the school is expected to be able to run the high-quality education. However, when we look at the facts on the field, Although with the help of BOS funds many schools especially vocational schools are not able to provide high quality education. Vocational schools naturally do cost more than general schools, even for certain majors of enormous operational costs. For example, we can

see many vocational high school (known by the term in Indonesian, Sekolah Menengah Kejuruan, hereinafter abbreviated as 'SMK') does not have appropriate and adequate laboratory support.

In the Preliminary analysis that has been done, there are at least various causes of the low quality of learning process. The main causes of the background are the local government policy, the ability of the community to contribute to education, poor managerial quality, and also inadequate teaching staff capacity. Besides this there is a reasonably dominant but rarely talked-about government policy that provides BOS funds per student at the same amount for the whole of Indonesia. In reality, this is certainly not appropriate because the cost of education is greatly influenced by several things, such as the following two main points; the geographical area of a school that will affect the price index and the type of field of science (majors). On the other hand the ability of the community to contribute to education or known by the tuition fee is relatively varied, where for urban areas, the community is relatively more capable while for rural areas the community is relatively inadequate.

Conceptually, BOS funds coupled with tuition fee will be able to meet the total financing to run the quality learning process. This means that the school is asked to calculate how much donation is expected from the community to be able to fulfill it. If calculated properly, especially for vocational education, community contributions will likely exceed the current level of community contributions to ensure quality vocational education. Schools do not dare to raise the tuition because on the other hand are competing to obtain a large number of students. For example, in many cities in North Sumatera tuition fee in vocational school still have only IDR 100,000 per month with an average of between IDR 150,000 to IDR 250,000. The amount of such educational donations, though added to the BOS funds will not be able to run quality vocational education, especially for departments that require support by many learning equipment. The consequence of this is that the school must sacrifice the quality of learning.

The aforementioned condition is actually a school response to the characteristics of people who have limited economic capability and not oriented to quality. The combination of these two fact results in poor quality of learning especially in areas where the community has weak economic capabilities. In the first stages, this study will collect data to provide empirical evidence that the low cost can collect from the community will have an impact on the low learning outcomes. This is necessary because the researcher believes that the government should provide a variety of BOS fund support including responding to differences in economic capacity of the community.

The government program is to provide quality education by providing operational assistance to respond to the low economic capacity of the community. Based on this concept, it should first obtain a total amount of costs necessary to provide quality education. The amount of these costs is then borne by the community in the form of educational contributions and by the government in the form of BOS funds. If the total cost scheme is known then it can be used as a rationale support for policy maker. The researcher believes that once the cost is found, the government can look for a formula to determine where the cost will be obtained. In this view, Researchers believe there are at least three main funding sources namely; tuition fee from society, BOS funds from the central government and special fund support from the local government.

Calculation of operational costs is not an easy thing. The complexity of the calculation is influenced by the level of education, type of education, region, and field of science. The Government has acknowledged the differences in operational costs based on education and type of schools to differentiate BOS for each level of education and differentiate BOS funds for vocational and general schools. The calculation of BOS funds for vocational schools is certainly more complicated because the learning process that requires more types of financing and variations of majors. Another complexity is the difference in the amount of operational costs caused by differences in inter-regional price standards. Differences in the amount of operational costs between regions have not been taken into account by the government. The amount of BOS funds per student for the same level is still the same for all regions of Indonesia, whereas ideally the government should consider the total cost and be adapted to the ability of people in the region to contribute education.

This standard cost calculation analysis can adopt from the calculation pattern applied in the company in calculating the cost of goods to produce a good or service or calculate the cost of a certain activity. In accounting, the theoretical foundation used to solve the problem of cost calculation in schools is similar to that of a public company with a traditional cost accounting approach and Activity Based Costing (ABC). Horngren and Datar (1) say that ABC is a cost approach that focuses on activity as a fundamental cost object. Such activities as a basis for charging costs on other cost objects such as production, services, or customers.

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Datar (1) say that ABC is a cost approach that focuses on activity as a fundamental cost object. Such activities as a basis for charging costs on other cost objects such as production, services, or customers.

In the aforementioned explanation, the activities of the learning process can be calculated as the basis of cost calculation to accumulate into the amount of cost of providing educational services. Goods and services produced by the company can be analogous to school graduates so it should be calculated the amount of costs to produce a graduate of an education level. This is useful enough to be examined in order to provide a rational academic foundation for policymakers to design an appropriate targeting strategy and provide optimal benefits. Due to various limitations, this study will provide a unit cost analysis for one graduate with focus on analyzing the data obtained for the north Sumatra region. Analysis of the data can already indicate the importance of cost-based analysis of areas and other characteristics in determining the value of BOS based on various characteristics

## 2. Purpose and Urgency of Research

In accordance with the aforementioned explanation, it is necessary to prepare the financing structure and the amount of financing required for the implementation of quality education. The financing structure will decompose the financing components that must be met in accordance with the National Standards of Education and local content for each region. The amount of financing involves the amount of unit cost for each part of the structure so that it can obtain the total cost of education and also the amount of cost per student. The final goal to be achieved by this research is to encourage the government to adopt an optimal funding policy.

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 such as; unit cost to produce one vocational school graduate for each region and community capability in the area. The government can then assign an OS fund that suits the nature of the matter.

### 3. Literature Review

This research will be focused to arrange financing structure to be able to carry out the learning process accordance with national standard of education. In another sense 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 actually an attempt to calculate the cost of production. In the study of accounting, the calculation of cost of production became a study discussed in an accounting specialization that is cost accounting and management. In a public company, 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.

#### 3.1. 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 production to individual product units using direct working hours. In traditional cost systems, the cost drivers used are based only on the unit, as measured in direct working hours, or material costs. 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 traditional method of financing in 1980 has been widely challenged due to its less relevant method, less accurate, and less timeliness. At that time, then introduced

a new method is the method of financing Activity Based Costing (ABC). Krishnan (2) stated that Activity Based Costing (hereinafter abbreviated ABC) was first developed by Cooper and Kaplan, a boarding system designed to reduce the risk of inconsistent and volatile cost allocations that is very close to traditional boarding systems and is expected to Providing accuracy in better cost allocation. Various researchers globally have conducted testing on Activity Based Costing. Eggers and Bangert Jr (3), Capps and Timlin (4), Ip, Li (5), Krumwiede (6), Krupnicki and Tyson (7), and Sarokolaei, Ebrati (8) stated that ABC besides gives better accuracy in determining the financing of a product, can also improve the basis of strategic policy, resource allocation used, product mix, price and marketing. Furthermore, basically the costing method based on ABC is then highly beneficial for the complex manufacturing industry, industry with distinct 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.

Ruhupatty and Maguad (9), 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 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 Yılmaz (10) 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 businesses which then provide excellent benefits.

### 3.2. 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 (2) 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 can leverage them to improve the preparation of better budgetary constructions. Thus, the ABC-based financing system will be able to help the service sector to understand the cost and value of the essential services activities in controlling the increase in operational costs.

Maelah, Amir (11) states that today many service organizations are revaluing their financing system and using ABC as a new system that is more competitive in the market today. A lot of research on 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 still not comprehensive and rare.

Ruhupatty and Maguad (9) stated that there has been a lot of research that studies the benefits of ABC applications in the service sector. Vazakidis, Karagiannis (12) examines the application of ABC in the public sector, especially to measure the cost of services performed by public offices. Krishnan (2) 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 Yılmaz (10) 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.

### 3.3. Activity-based costing at education institution

Research conducted by Krishnan (2) is one of the research conducted on the educational organization that is the institution of higher education. The study aims to analyze applications of ABC at higher education institutions, especially at universities and how it contributes to operations and business in the context of decision-making. Another thing to be aware of is to be able to verify that the ABC financing system can provide better control than the traditional way. Krishnan's research has resulted in the formula of departmentalization of services provided to college students based on their resource needs. In addition, a cost allocation model based on ABC and ABC model has been generated for the services provided to the students on administrative and registration office affairs. The results of the study suggest that ABC provides a more accurate system in cost management and enables high-level managers to calculate the true cost of the product, that is, services provided to students. In short, the ABC-based financing system clearly states that it can help colleges understand what costs will arise, what controls them, and which costs might add low value to cost objects. Thus, it is likely that ABC can be a system that gives predictions to planning, cost estimation, and elimination of non-value-added activities that will be most useful for management in determining operational strategy decisions.

Maelah, Amir (11) reveals that there have been several ABC implementation studies conducted on the specialized service sector to higher education institutions, although it is stated that many of these studies were conducted by not being comprehensive by simply laying objects of such research limited to the parts Such as laboratories or libraries. Research Ruhupatty and Maguad (9) perform the analysis of cost measurement for quality at universities by using the perspective of ABC in certain parts of college. They stated that there are four activities that can be categorized related to the operational in college that is the time-controlled teaching, research, service, and administration.

Coskun and Yılmaz (10) conducted pricing research on educational institutions using the ABC approach. Of course, one of the pricing will depend on the cost that will be generated in running a service cycle other than the market base. They stated that by

using ABC the costs that would be sacrificed per student in providing services provided to educational institutions would be calculated more accurately than using traditional cost allocation approaches. The ABC method provides data from cost factors, activities, resources, performance measurement, customer profits, distribution chains, suppliers, brands, and indirectly affects the financial performance of educational institutions. ABC is based on processes, activities, and then products, services, and consumers as a source of cost so that the cost will be calculated significantly. ABC will consist of two phases which then consists of five stages: the first phase is to accumulate the total cost of each activity and calculate the cost of the combined cost per activity. The second phase is to allocate the accumulated costs to the cost object through the appropriate cost allocation basis.

## 4. Research Metodology and Funding

This research is planned to be carried out in two stages. Up to now one stage has been completed. The second phase will be continued in July until December 2017.

### 4.1. Phase one (March to June 2017)

This second stage is the initial stage by doing the following activities:

1. Survey of vocational schools in North Sumatra 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.

### 4.2. Phase two (June to December 2017)

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 da parts, that is, ideal activities (should be run according to educational standards) and activities that are actually implemented. This stage is quite difficult and requires quite a long time. The general procedure for doing so is to interview all the people involved or at least to the party responsible for the activity. Theoretically, how to understand the activity and how the activity is accumulated is organized into five levels: unit-level, batch-level, product-level, customer-level and organization-sustaining. This level distinguishes the cost characteristics based on their characteristics.

### 2. Charge the Cost to Activity Fees Pool

Pool activity cost is a container that accumulates all costs associated with a single activity within the ABC system. For example, the cost pool for the implementation of the automotive practicum will be burdened with all the resources consumed to carry out the automotive lab work such as the cost of the electric workshop, the cost of practicum maintenance, etc. The activity size in this cost pool is the number of orders received. This activity is a batch-level activity because every activity leads to work regardless of the number of students. Most overhead costs are classified in the accounting system based on where the cost is incurred.

### 3. 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

4. Charge the cost to the cost object by using activity rate and activity size. In the second phase allocation, activity tariffs are used to charge each student's expenses. This is done by diverting overhead rates per cost group by the amount of cost drivers charged to each student.

5. After the production cost is calculated it will be compiled final calculation to determine the amount of cost to produce a graduate of vocational school.

The research was funded by the Ministry of Technology Research and Higher Education through a competing research grant scheme for 2017.

## 5. Result

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 aforementioned variables. 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

## 6. 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 ability 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.

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 conducted 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.

TABLE 1: Recapitulation of survey result data.

No.	Region <sup>1</sup>	Number of 12th Graders <sup>2</sup>	Average Income (IDR) (Person/Year)	Average Tuition Fee (IDR) <sup>4</sup>	Quality Level of Education Facilities <sup>5</sup>	Average National Exam <sup>6</sup>
1	Kota Medan	16.381	74.471.410	347.500	7	66.68
2	Kota Pematangsiantar	3.518	42.704.160	225.750	6	71.44

No.	Region <sup>1</sup>	Number of 12th Graders <sup>2</sup>	Average Income (IDR) (Person/Year)	Average Tuition Fee (IDR) <sup>4</sup>	Quality Level of Education Facilities <sup>5</sup>	Average National Exam <sup>6</sup>
3	Kota Binjai	2.387	31.914.700	252.450	5	69.12
4	Kota Tebing Tinggi	1.703	27.448.570	215.000	7	62.18
5	Kota Tanjung Balai	680	36.089.130	215.000	5	57.91
6	Kota Sibolga	1.078	44.235.020	175.000	5	52.46
7	Kota Padangsidempuan	2.219	21.088.780	192.500	5	68.47
8	Kota Gunungsitoli	1.520	26.276.260	175.000	5	59.76
9	Kabupaten Deliserdang	9.668	37.813.700	275.000	5	67.31
10	Kabupaten Langkat	5.158	29.950.880	250.000	5	66.19
11	Kabupaten Simalungun	3.330	32.066.520	235.000	4	75.62
12	Kabupaten Karo	1.364	38.887.870	225.000	5	51.12
13	Kabupaten Dairi	1.958	24.447.890	165.000	3	56.40
14	Kabupaten Asahan	3.066	37.579.550	212.500	5	52.97
15	Kabupaten Labuhanbatu	2.226	52.215.160	272.500	6	81.30
16	Kabupaten Tapanuli Utara	2.046	19.864.250	162.500	2	52.84
17	Kabupaten Tapanuli Tengah	1.639	20.399.800	175.000	2	52.56
18	Kabupaten Tapanuli Selatan	1.053	36.735.920	195.000	4	67.72
19	Kabupaten Nias	865	19.615.050	145.000	2	58.39
20	Kabupaten Toba Samosir	1.619	31.350.020	175.000	5	53.52
21	Kabupaten Mandailing Natal	1.950	22.276.370	185.000	3	49.16
22	Kabupaten Humbang Hasundutan	1.458	24.492.560	179.500	3	49.55
23	Kabupaten Pakpak Bharat	284	18.217.460	152.500	5	78.28
24	Kabupaten Nias Selatan	1.800	15.385.020	135.000	2	66.89
25	Kabupaten Samosir	758	25.396.550	245.000	5	76.00
26	Kabupaten Serdang Bedagai	2.488	33.130.250	275.000	5	68.15
27	Kabupaten Batubara	1.696	62.211.110	257.500	4	51.17
28	Kabupaten Padanglawas Utara	437	32.640.830	205.000	3	70.03
29	Kabupaten Padanglawas	1.039	30.631.140	207.500	3	70.12
30	Kabupaten Labuhanbatu Utara	1.529	50.091.020	245.000	5	67.95

No.	Region <sup>1</sup>	Number of 12th Graders <sup>2</sup>	Average Income (IDR) (Person/Year)	Average Tuition Fee (IDR) <sup>4</sup>	Quality Level of Education Facilities <sup>5</sup>	Average National Exam <sup>6</sup>
31	Kabupaten Labuhanbatu Selatan	1.099	60.757.080	250.000	5	76.98
32	Kabupaten Nias Utara	1.010	18.799.630	165.000	2	60.52
33	Kabupaten Nias Barat	449	14.993.100	132.500	2	73.81

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 12<sup>th</sup> grade that takes the national exam in 2016.

(3) Average income/person/year for each region according to 2015 BPS data

(4) Average tuition fees earned by taking a random sample of 25 vocational schools per each region.

(5) The quality of infrastructure facilities as measured by checklists prepared by researchers with a scale of 1–10.

(6) The value of national examination in 2016 obtained from the Ministry of Education and Culture.

TABLE 2: The correlation coefficient between various data.

No.	Relation	Value
1	Average Income – Average National Exam	0.12
2	Average Tuition Fee – Average National Exam	0.30
3	Quality Level of Education Facilities – Average National Exam	0.28
4	Average Income – Average Tuition Fee	0.79
5	Average Tuition Fee – Quality Level of Education Facilities	0.69

Note: Classification of correlation values Sarwono (13); '0': There is no correlation between two variables; '0–0.25': The correlation is very weak; 0.25–0.5: Correlation is moderate; '0.5–0.75': Strong correlation; '0.75–0.99': The correlation is very strong; '1': Perfect correlation.

Furthermore, the results of the analysis also shows 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 was 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 aforementioned 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 characteristic 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 school. 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 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.

## 7. Conclusions and follow-up research

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 as tuition fees 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.

Based on the aforementioned conclusions then the next stage of this research is very necessary to be implemented that is to determine the unit cost of each vocational school graduate with Activity Based Costing method. It needs to be done so that the purpose of this research can be achieved. This stage will be implemented in the period of July to December 2017.

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