

## Analysis of Before and After the Formation of Waste Bank on Elementary Student Performance in West Jakarta

Helsinawati\*

Faculty of Economics and Business – Universitas Mercu Buana, Jalan Meruya Selatan No. 1, Meruya Selatan, Kembangan, Jakarta Barat, 11650, Indonesia

**\*Corresponding author**  
Helsinawati

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**Abstract:** This study aims to analyze the differences before and after the formation of waste banks in students, while the long-term goal is reporting and business strategy of Waste Bank at school (including a simple model of financial statement). The method used in this study is method of comparison with different test. The assessment of student performance between before and after the established of waste bank there is significant difference in the assessment of student performance at elementary school.  
**Keywords:** Student Performance Assessment and Waste Bank.

### INTRODUCTION

Regulation of the Minister of Environment No. 13 in 2012 about The Implementation of Reduce, Reuse, and Recycle through Waste Bank [1]. Waste bank managed by the principles of 3R (Reduce, Reuse, and Recycle) [2-5]. Bank of waste is a concept dried and sorted waste collection and management have saved "fund" like banking but waste (not "money") [6]. This regulation drives the community to form a waste bank[7]

Working mechanism of Waste bank starts from the separation of waste into organic and non-organic waste and non-organic waste deposited to the Waste bank, Waste bank officers will weigh the non-organic waste, then book on the bank's Waste bank and on the reports related to Waste bank transactions, hand over cash (cash) to customers for cash purchases. Types of waste that can be saved on a Waste Bank include: 1) plastic, 2) paper, 3) zinc and iron, 4) Aluminum, 5) Bottles and Glass, 6) Brass and Copper.

However according Rahmadi and Mulyani [8] states that an innovative waste bank can be an input to improve community empowerment in an activity.

The School Waste Bank as an environmentally-based organization was established to educate students to manage waste by the principle of 3R (*Reduce, Reuse, and Recycle*) applied to school schools aimed at educating students of environmental care and practicing entrepreneurial, organization and management.

The Waste bank that has been established in Subdistrict Kembangan based on the data we obtained from Environmental Unit of Kembangan Sub-district in June 2017 amounted to 27 Banks.

The Elementary School is owned are the local government of DKI Jakarta, one of the elementary shool was establishing the waste bank by lecture team of Universitas Mercu Buana is SDN 01 Meruya Selatan at Kembangan Sub District, West Jakarta.

Leadership and communication is significant to teacher performance [9]. The head master use leadership and communication to manage the teacher and student to formation the waste bank. The organization structure waste bank at this school is combination between students and teachers as a method for student learning implementation about organization, management and business. This waste bank formed is joint with the local government Sub district Kembangan, Meruya Selatan Village, environmentalists West Jakarta and the team lecture of Mercu Buana University and environmentalists. Present at the formation of waste bank is Head of Kembangan Sub-district, Secretary of Head of Village, Head of Environment Unit of Kembangan Subdistrict and environment observer of West Jakarta.

### Formulation of the problem

Based on the description above background then the problem is as follows:

“ How to evaluate Student Performance before and after the establishment of Waste Bank in Elementary school?”

The scope of this study is limited only to the assessment of student performance before and after the establishment of Waste bank for differences in student performance on Elementary school by using comparative statistical analysis before and after through different test.

### Research Objectives

The purpose of this research is to analyze student performance due to difference before and after conducting the establishment of Waste Bank in elementary school

## LITERATURE REVIEW

### Waste bank

Waste Bank by Regulation of the State Minister of Environment No. 13 of 2012 is a recycling and/or reusable waste collection and recycling site that has economic value. Waste Bank is one of the alternatives to invite people to care about waste, whose concept may be developed in other areas [1].

Waste bank is a place where there are service activities to the waste depositors conducted by the bank teller Waste. The Waste bank room is divided into three spaces/locker for storing savings, before being picked up by collectors/third parties [10].

The purpose of the establishment of a Waste bank, of course, receive waste storage from the surrounding community, and make money. Waste bank also aims to maintain the environment, the rest so that people can empower the used goods into something that can be used as money. Its performance is more on the Waste around the community environment sorted, then weighed and then appreciated [11]

Waste bank model at school with approach sub system of curriculum, sub system environment, and sub system structural can be increase activity of waste bank management[12]. The role of school waste bank of implementation 3R program but people income still small.[13].

According to Ummah [14] waste bank is the place to save waste has devided passed. The development of waste bank is inseparable from the existence of organization activities and community participation as the most important component in the sustainability of waste bank management.

Characteristic of waste bank in schools as gathering many people can be the largest waste generator in addition to market, households, industries and office. Waste can generally be separated into

1) organic/perishable waste derived from: food scraps, vegetable residue and fruit skin, fish and meat residue, garden waste (grass, leaves and twigs). 2) Inorganic/non spoiled waste: paper, wood, fabric, glass, metal, plastic, rubber and soil. Waste produced by school is mostly dry waste and only a little bit of wet waste. The resulting dry waste is mostly paper, plastic and metal whereas the wet waste [15]

### Adiwiyata Program

Adiwiyata program is one program of the Ministry of Environment which is the implementation of the rules of Ministry of Nomor 02 th, 2009. This program is a form of the award given by the government to the institutions of formal education are considered instrumental in developing environmental education.

The word Adiwiyata comes from the Sanskrit word "adi" means is big, great, good, perfect, and "wiyata" means is the place where someone gets knowledge, the norm. The meaningfull: A good and ideal place where the knowledge, norms and ethics that can be the basis of humankind towards the creation of the welfare of life and the ideals of sustainable development. The objective of the Adiwiyata program is to realize the school's citizens who are responsible for the protection and management of the environment through good school governance.

To achieve the objectives of the Adiwiyata program, there are 4 components of the program that are integrated into the Adiwiyata school, which are: a) Environmentally sound policies, b) Implementation of environment-based curriculum, c) Participatory based environmental activities, d) Management of environmentally friendly means of support [16].

### Performance Assessment

Sudjana [17] states that the assessment is the process of giving or determining value to a particular object based on a certain criteria.

Meanwhile, according to Herliani & Indrawati [18] *Performance assessment* is the appraisal is based on observations during the demonstration or evaluation capability resulting product creation

Assessment of learner is learning outcomes needs to be done on a continuous basis so that the learning outcomes are monitored [19].

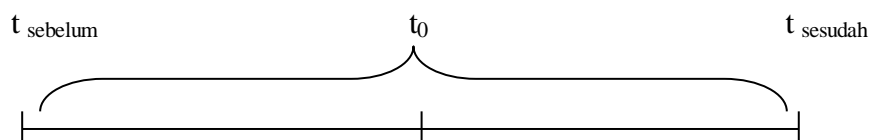
Regulation of the Minister of Education and Culture No. 104 of 2014. The assessment form may be written test, observation, practice test, and individual or group estimator [20].

Scientific processes according to Subali [21] consist of aspects: a) basic skills, b) processing skills, and c) investigative skills. Based on the opinion of such

experts, it can be formulated that the processes of science as a result of inquiry (processes science as inquiry) consist of sub-aspect: 1) planning of inquiry, 2) conducting investigation, and (3) reporting of result of investigation.

The results of science performance assessment in the International Student Assessment (PISA) program, it is known that the average score of science performance put Indonesian students in the 50th rank of 57 countries [22].

## METHOD



**Fig-1.1: Comparison Period Student Performance**

The definition of operational variable can show in table-1 below as follow:

**Table-1: Definition of Operational Variable**

Variabel	Definition	Measurement	Scale
Student Performance	Student Performance is value of performance in elementary school.	$R_{it} = \frac{P_{it} - P_{it-1}}{P_{it-1}}$	Ratio

## Population and Sample Research

Population in this research is the bring of industry company that is teacher, student and parent the sampling technique in this research is done by purposive sampling method with random sample, where the criteria are:

- 1 Environmental Policy
- 2 Implementation of Environment-Based Curriculum
- 3 Participatory Based Environmental Activities
- 4 Economic Enhancement Student

## Data Collection Techniques

This research data collection technique used is library study/documentation which is technique of collecting secondary data, that is technique of collecting data obtained indirectly through medium of intermediary (second party). This research requires data of student report of school to see data student performance with questioner for teacher, parent and elementary student with linked scale.

## Research Design

In addition, this research is a research event, which is research that aims to test information content based on a time series that is before established of waste bank and after established off waste bank so that researchers can see the difference in student performance of the event using the design comparative research, ie research that aims to compare. As to which will be compared in this study is the student-performance before the established of waste bank and after established of waste bank

Here is a picture of student performance comparison period of before and after established waste bank.

The above data describes the performance of students associated with junk bank which each contains 6 statements with topic; No. 1 on environmentally sound policy . 2. Implementation of an environment-based curriculum; 3. Participatory based environmental activities, and 4. Economic empowerment of students.

## Data Analysis

### Descriptive Analysis

Descriptive analysis is an analysis that provides an overview of a state of data or observations that have been done by collecting, summarizing, and presenting a data that gives useful results. The goal is to provide a picture of a data so that the data presented can be understood and informative for people who read it.

### Data Quality Analysis

Data quality analysis uses a normality test that aims to test whether the data used has been normally distributed. The test used Kolmogorov-Smirnov with the assumption of normality on the significance number (sig 2-tailed)> 0.05, and vice versa.

## Hypothesis

- Ho: Data is normally distributed
- Ha: Data is not normally distributed

### Test statistics: Kolmogorov-Smirnov Criteria Test

- If sig > 0.05 then Ho is accepted
- If sig < 0.05 then Ho is rejected

### Average difference analysis t Test (Paired Sample t-test)

The data analysis method used in this research is the average difference test of two paired samples (paired sample t-test), that is data analysis method which aims to test whether there are difference of mean for two free samples (independent) in pairs. As for the coupled is the data in the second sample is a change or the difference from the first sample data. This test is performed to see if there are any differences between the student performance before and after the formation of Waste bank with a greater significance level than alpha 0.05 or (sig 2-tailed) < 0.05.

### Hypothesis

Hypothesis is a provisional or temporary answer and still to be verified [23]. The hypothesis as follow:

- Ho:  $\mu_1 - \mu_2 = 0$ , means there are not difference Student performance between before and after formed waste bank.
- Ha:  $\mu_1 - \mu_2 \neq 0$ , Means there are difference Student performance between before and after formed waste bank

### Statistics Test: Test t (Paired Samples t Test)

#### Test Criteria

- If sig > 0.05 then Ho is accepted
- If sig < 0.05 then Ho is rejected

### Wilcoxon test

The wilcoxon test is a nonparametric statistical test used to determine whether or not there are an average difference between two paired samples, so that the wilcoxon test is often used as an alternative to paired sample t-test when the study data is not normally distributed, where the data is not normally distributed considered not to meet the criteria in statistical testing parametric especially paired sample t-test.

### Hypothesis

- Ho:  $X_1 = X_2$ , means there are not difference Student performance before and after established waste bank
- Ha:  $X_1 \neq X_2$  means there are differences student performance between before and after the establishment of Waste bank

### Test Statistics: Wilcoxon Test

#### Test Criteria

- If sig (2-tailed) > 0.05, then Ho is accepted
- If sig (2-tailed) < 0.05, then Ho is rejected

### Hypothesis

Hi: Suspected there are differences in student performance between before and after established wasted bank at elementary school.

## RESULTS AND DISCUSSION

### Overview of The Reseach Object

Waste Bank at Elementry School on Subdistric Kembangan on West Jakarta. One of waste bank was established by Universitas Mercu Buana apply reseach team.

### The Student Performance

The Student Performance average before and average after formaed waste bank show in Table-3 below as follow:

**Table-3: Elementry Student Performance**

Statement	Average Before	Average After
1.1	2.85	4.01
1.2	2.86	3.95
1.3	2.86	4.09
1.4	2.98	4.00
1.5	2.91	4.10
1.6	2.95	4.04
2.1	2.88	3.98
2.2	2.90	3.90
2.3	2.91	3.98
2.4	2.75	4.01
2.5	2.84	3.97
2.6	2.81	3.87
3.1	2.85	4.13
3.2	2.91	3.99
3.3	2.78	3.99
3.4	2.97	3.81
3.5	2.72	3.84
3.6	2.79	3.93
4.1	2.69	3.72
4.2	2.67	3.58
4.3	2.70	3.90
4.4	2.68	3.41
4.5	2.44	3.44
4.6	2.56	3.83

## The Result of Statistic Descriptive Test

Table-2: The Result of Statistic Descriptive Test

	N	Minimum	Maximum	Mean	Std. Deviation
Average of student performance before established waste bank	24	2,44	2,98	2,8025	,13192
Average of student performance after established waste bank	24	3,41	4,13	3,8946	,18921
Valid N (listwise)	24				

The above data of table-2 that researched as much as performance of elementary student before established Waste Bank where mean as 2,8025 and mean value of 3,8946 means is changing in the increase of the mean value as 1,0921 The minimum value before

established Waste Bank as 2,44 and the minimum value after established Waste Bank is value as 3,41 The maximum value before established waste bank as 2,98 and the maximum value after established waste bank as 4,13.

## Data Quality Test Results

Tabel-4: Result of Normality Test

One-Sample Kolmogorov-Smirnov Test			
		Average of before established	Average of after established
N		24	24
Normal Parameters <sup>a,b</sup>	Mean	2,8025	3,8946
	Std. Deviation	,13192	,18921
Most Extreme Differences	Absolute	,154	,178
	Positive	,089	,107
	Negative	-,154	-,178
Kolmogorov-Smirnov Z		,752	,872
Asymp. Sig. (2-tailed)		,623	,432
a. Test distribution is Normal.			
b. Calculated from data.			

The above data it can be seen that the data diffuses normally because the level of sig (2 tailed) before established Waste Bank is above 0.05 or 5% in 0.623 or 6,23% in and after established Waste Bank 0.432 or 43.2% because data is normally distributed, hence can be used t test (paired sample t-test), so test of wilcoxon to find difference of financial performance of elementary student before and after waste bank is normally distributed.

## Hypothesis Testing

After the of data quality the next step is done Hypothesis test data to test the hypothesis stating "there are differences in Student performance before and after waste bank. The test using wilcoxon is shown in the following as bellow.

Tabel-4: Result of Wilcoxon Test: Signed Ranks

		N	Mean Ranks	Sum of Ranks
Average of after for performance of elementary student - Average of before for performance of elementary student	Negative Ranks	0 <sup>a</sup>	,00	,00
	Positive Ranks	24 <sup>b</sup>	12,50	300,00
	Ties	0 <sup>c</sup>		
	Total	24		
a. Average of after for performance of elementary student < Average of before performance of elementary student				
b. Average of after for performance of elementary student > Average of before performance of elementary student				
c. Average of after for performance of elementary student = Average of before performance of elementary student				



The above table-4 show the data analyzed 24 data there are all have positive ranks means is the difference between before and after variable (after deducting before) because ratio student performance after formed Waste bank > ratio student performance before formed

Waste bank. The Mean ranks for negative ranks is 0, but the Mean ranks for positive ranks is 12,50.

The calculate of Test Statistics for test the hypothesis about data significance as seen in the table-5 bellow as follow:

**Table-5: Result of Statistic Test**

Test Statistics <sup>a</sup>	
	Average of after - Average of before
Z	-4,286 <sup>b</sup>
Asymp. Sig. (2-tailed)	,000
a. Wilcoxon Signed Ranks Test	
b. Based on negative ranks.	

The table-5 above show the value of Z obtained the result of the difference in value of performance student between after and before formed waste bank as -4,286 based on negative ranks means is there are increase in student performance students performance, because the student performance before formed waste bank < the student performance after formed Waste bank, while for sig (2-tailed) as 0.00 means is there are a change in student performance increase and significant effect, because sig (2-tailed) is  $0.00 < 0.05$  means is  $H_0$  rejected and  $H_1$  accepted is there are difference student performance.

## CONCLUSIONS AND RECOMMENDATIONS

### Conclusion

Based on the results of statistical tests on the assessment of student performance between before and after established of waste bank at school, it can be concluded that there are significant difference in the elementary student performance.

### SUGGESTIONS

Based on the conclusion above it is expected the student of elementary school would like to defend and increase the performance with training for produce creative recycle waste product

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