Machine Shop

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THE BEHAVIOUR OF MACHINE SHOP MANAGERS IN MANAGING WASTE

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ABSTRACT

This research aims to analyze the influence of level of education that is possesed by the machine shop manager, pollution knowledge, compliance with environmental regulations, and motivation on environmental issue. This research also looks at the behavior effect of the machine shop manager in managing Waste. This research used survey method and quantitative approach to achieve the objectives of this research. Moreover, questionnaire or tests given to 200 respondents in 14 sub districts in Makassar. The researcher obtained data through documentation, observation, Focus Group Discussion (FGD), and in-depth interviews that involve all stakeholders and experts in the field of the environment. There are some important results of the research in this study. First, the level of education is variable, knowledge, and obedience variabels have a direct and significant influence toward motivation. Secondly, the level of education, knowledge, and obedience variabels also have a direct and significant influence on behaviour of the Managers. Inaddition, motivation variabel has a direct effect to the behaviour. It is characterized by getting the value of the P-value > 0.05.

INTRODUCTION

A high population growth is one of opportunity for the Government of Indonesia to build and improve the industry sectors as an option of sustainable development in Indonesia. Industrial machine shop requires several aspects to meet community needs such as: improving industry as economic aspects, intergenerational justice as a social aspect, and preservation of resources support as environmental aspects (Elliott, 2005: 7). However, the development of industry lead to negative impact on the environment, such as pollution, environmental degradation, and environmental damage (Zhao, 2010: 112). It is because the shopkeeper and Managers in the machine shop is not serious in managing their wastes that are produced either ; solid waste, liquid waste, or gas (Sunardi, 2009). This problem had driven an impact of environmental, economic and health issues such as an increasing number of patients with acute respiratory tract infection disease (Soedomo, 2001). According to Salikin (2003: 5) management of the business

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activities of the machine shop for motorcycles is not easy because there are many problems encountered such as the quality of human resources, and natural resource problem.

Indonesia produces about 23.630.748 million tons of oil were used each year. One gallon of used oil can contaminate one million gallons of drinking water (Media Data research, 2009). Furthermore, David, Wulandari (2009), states that oil, mercury, cadmium, and lead are used in many industrial processes, but after they are used, they are usually thrown away. Emission test randomly in Makassar identifies that there are 90% of urban public transport in critical condition because of all the parameters of the emission test are not ideal (Dishub, 2009). It is also due to the age of the vehicle, the type of engine, and lack of machine maintenance (Sunardi, 2011).

The area surrounding the machine shop became increasingly distressed by population density. The area is likely to experience a decline in environmental quality due to some actions of the shopkeepers. They discard the used washing fluid of spare part in waterways. They burn trash in front of the machine shop. They do not sort various wastes. They do not recycle waste. The shopkeepers with various limitations have low motivation on the cleanliness of the environment surrounding the machine shop. Therefore, there is a tendency of the pollution that is growing from year to year. Hence, the study on the influence of behaviour-based machine shop managers for the motorcycle is crucial to do as the basis of Waste Management issues.

Environmental factors around the machine shop become the factors that can affect the behaviour of the machine shop Managers. Direct or indirect influence toward responsible environmental behaviour according to Hungerford and Volk (1990) is knowledge of the issues, action skills, desire to act, circumstantial factors such as economic and social attitudes, such as personality, locus of control and individual responsibility. A number of researchers have used the theory of reasoned action (TRA) (Fishbein & Ajzen, 1975) to test the relationship among attitudes, subjective norms, intentions, and behaviors. Meanwhile, Theory Planned Behaviour (TPB) can be used to predict a person going to do or not to do the behavior. The rational choice theory of linear models can produce behavior, where the information creates knowledge, forming the attitudes and leading to behaviour (Kolmuss and Agyeman, 2002) . Moreover, attitude is a reaction or response that is still closed to a stimulus from a person or object (Allport, 2004). Mulyadi (2011) reveals that the urgency of the motivation is creating excitement on a clean environmental condition of machine shop so that Waste Management environmentally can be achieved.

Obedience is the appropriate rules of behavior and discipline.. There are several variables that affect the level of obedience according to Ferdinand (2007) such as demographics such as age, gender, socio-economic and educational status. Whereas, the factors that affect the disobedience according to Nur (2004), are the understanding, the quality of interaction, social isolation, and confidence. According to Stuart (2005) , there are some strategies to increase obedience, such as professional support from machine shop manager, social support, and behaviour cleanliness.

According to Yustina (2006) education is very influential with respect to skills, behaviour and attitude of the person. Our knowledge is our own construction (Von Glasersfeld, 1996). Knowledge consists of three domains, namely cognitive, affective and psychomotor.The various aspects that affect the behaviour of Waste Management can come from the environment around the machine shop. In addition, they also come from inside of the person, such as education, knowledge of pollution, obedience with environmental regulations, and motivation on environmental cleanliness.Based on the explanation above, the formulation of the problem examined is the effect of the education of machine shop manager, knowledge about pollution, and obedience in the regulatory environment, with respect to motivation on environmental cleanliness. In addition, the study also examined the effect of behavior towards Waste Management.

This research aims at analyzing the impact of education owned by the machine shop manager, knowledge about pollution, compliance with environmental regulations, and motivation on environmental cleanliness. In addition, this research aims at finding out the effect on behaviour in Waste Management environmentally.

RESEARCH METHODOLOGY

A. Kind of the Research

This research is quantitative research. This research analyzed the influence of the level of education owned by the machine shop manager, knowledge about pollution, compliance with environmental regulations, and motivation on environmental cleanliness.

In addition, this research found out the effect on behaviour in Waste Management.

B. Sampling Technique

The technique of sampling in this research was purposive sampling method. The numbers of machine shop are 343 units in 14 sub districts in Makassar. Furthermore, by using purposive sampling method, the researchers determined the number of samples. There were 58, 31% for each subdistrict with the total samples of the machine shop managers were 200. They were as the respondents of this research.

C. Research Design

In this study, all variables are considered homogenous. All independent variables have a relationship directly or indirectly toward the dependent variable. The indirect relationship occurs because there are independent variables namely; variable between (Y1/ motivation on environmental cleanliness) that must be traversed before making contact with the dependent variable/Y2 (behaviour in Waste Management). The researchers describe the design of the research in the following figure.

D. Data Analysis Techniques

To achieve the purpose of the study used behavioral theory obtained from literature (library research), questionnaire /test, documentation, also obtained from observation (observation), conducted Focus Group

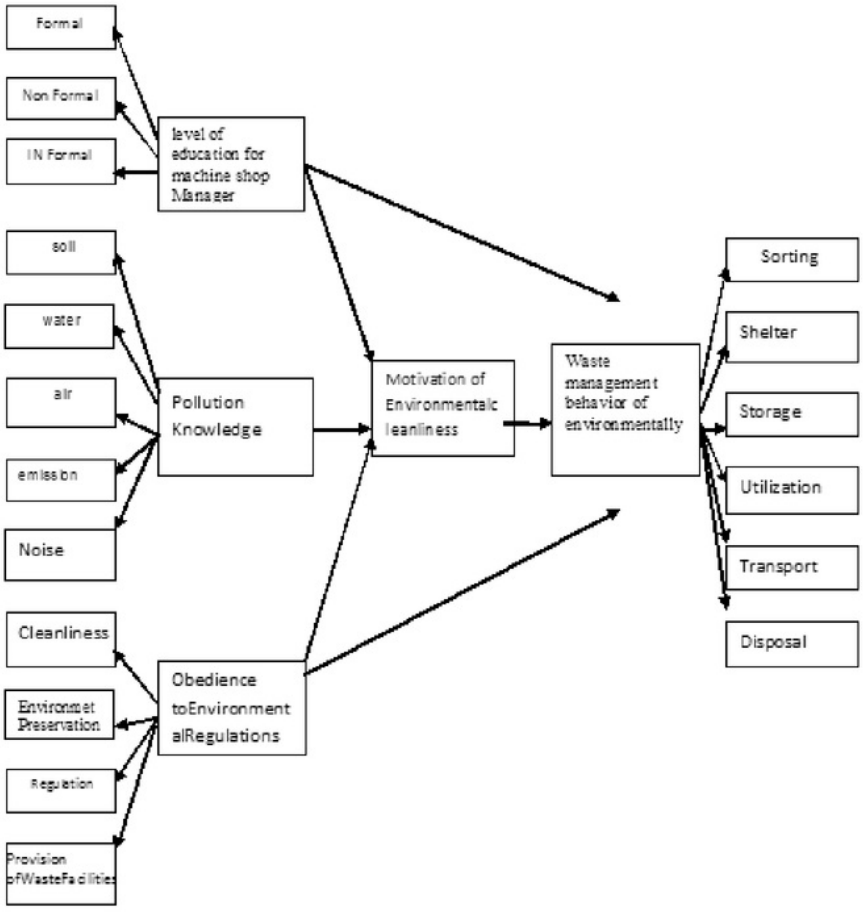

Fig. 1 The relationship among variables
Source: Results of synthesis theory, created for the purposes of research.

Discussion (FGD) and in-depth interviews involving all stake holders and experts in the field of environment. The results of data processing, FGD sand interviews were interpreted using Structural Equation Modeling (SEM). SEM analysis because it can be used to check the validity and reliability of the instrument, model testing relationships between variable sand to obtaina suitable model for prediction, it can be used in view of the size of the effect, whether a direct, indirect and total effect of exogenous variables on endogenous variables bound with the help of software AMOS6.0, as well as to obtain a structural model. The model can be used for prediction and verification model that can be used as a basis for policy – making city government.

RESULTS AND DISCUSSION

a. Descriptive Analysis

Descriptive analysis aimed at describing the research variables through the interpretation of the frequency distribution of respondents as a whole, both in the number of respondents (people), and the mean value of the grainsh as a question that is on the workshop organizer education variable (X1), knowledge of the pollution (X2), compliance with environmental regulations (X3), motivation on environmental hygiene (Y1), and environmentally sound Waste Management behavior (Y2) which is calculated based on the cumulative questions.

From Table 1, it can be explained that the average cumulative response of the education variable (X1) is 60.68 with a minimum cumulative answer's questions at 44 and a maximum of 96 cumulative answer questions. Cumulative average response of the variable knowledge (X2) is 23.77 with The minimum value of the cumulative answer questions 14 and maximum cumulative answer to the question is 29. Cumulative average response of variable compliance (X3) is 92.77 with a minimum cumulative answer to the question of 77 and a maximum of 142 cumulative answer questions. Cumulative average response of motivational variables (Y1) is 96.67 with a minimum cumulative score of 73 and answer questions answer a questions cumulative maximum of 119. Cumulative average response of behavioral variables (Y2) is 99.76 with a minimum cumulative score of 60 and answer questions answer questions for maximum cumulative 143.

b. Assumption Testing Results Structural Equation Model (SEM)

Univariate normality assumption was tested with the help of software AMOS 6.0. If the absolute value of the data Univariate CR Z is smaller than 5% is 1.96, then the univariate normal assumptions are met. Otherwise, if the value of Multivariate Data CR is greater than 1.96, then the univariate normal assumption is not met, meaning that the data is not normal. Test results assessment of normality following table, showing the majority of the absolute value of CR <1.96 then the univariate normality assumptions are met.

From Table 2 above, it can be seen that the critical value in the univariate skewness (skewness) most of the variables that are not too far from ± 2:58 (significant at 1%) so that the data can be inferred to approach a normal distribution. In the multivariate value of 51 447 is the coefficient of multivariate kurtosis with the critical value that is close to 37 129 ± 2.58. It is proved that the data are multivariate normal distribution can be said, both univariate and multivariate.

C. Testing Goodness of Fit SEM

The theoretical model on the conceptual framework of the study said to be fit if supported by empirical data. The results of testing the goodness of fit models, according to the results of the analysis with the help of AMOS program are presented in the output as in the Table 1. In essence Goodness of Fit is to determine whether the hypothetical model is supported by empirical data.

Results of Overall Goodness of Fit test based on Table 3, it can be seen that all criteria show fit models. This is indicated by the value of GFI which is 0990, and worth a good fit = 0.90 (goodfit), the value of

Table 1. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Education	200	44.00	96.00	60.6800	5.79964
Knowledge	200	14.00	29.00	23.7750	3.16297
Obedience	200	77.00	142.00	92.7750	7.15685
Motivation	200	73.00	119.00	96.6700	8.14079
Behavior	200	60.00	143.00	99.7600	13.44493
Valid N (leastwise)	200				

Table 2. Assessment of normality

Variable	Min	Max	Skew	c.r.	Kurtosis	c.r.
Kepatuhan	77.000	142.000	1.773	10.235	10.003	28.877
Pengetahuan	14.000	29.000	-.517	-2.984	-.025	-.073
Pendidikan	44.000	96.000	.824	4.757	6.177	17.833
Motivasi	73.000	119.000	-.073	-.424	-.164	-.472
Perilaku	60.000	143.000	.032	.187	.549	1.585
Multivariate					51.447	37.129

Table 3. Results of Testing Goodness of Fit

Fit Index	Recommended Value	Value
$\chi 2$/ df	Small value	5.478
p-value	p-value > 0.05	0.065
GFI	GFI = 0,90	0.990
RMSEA	RMSEA = 0,08	0.090
AGFI	AGFI = 0,90	0.925
TLI	TLI = 0,95	0.702
CFI	CFI = 0,90	0.940

which is worth 0.925AGFI=0.90. Although there are still some value below the cut- off value of value but the value is not so far from the cut – off value. So that the model can still be considered as a good model.

C. Inferential Analysis

1) Analysis of Structural Educational Model in the structural, model is essentially hypothesis testingin this study. There are three types of effects will be presented in a structural model, the direct effect (Direct Effect), the indirect effect (Indirect Effect), and the total effect (totaleffect).

Hypothesis testing is done to test the direct effect of Critical Ratio (CR) on each of the direct effect of the partial path. If the value CR > 1.96 or value of P<0.05, we can conclude there is a significant effect, otherwise if the value of CR <1.96 or values P > 0.05 then we can conclude there is no effect. Complete analysis of the results, given in the results of SEM analysis. The following table presents the results of testing the hypothesis that the direct effect (direct effect).

From the Table 4, it can be analyzed that the education variable (X1), knowledge (X2) and variable compliance (X3) and a significant direct effect on motivation (Y1). This is indicated by the significant value of p - value <0.05 level. Education variable (X1) and compliance (X3) and a significant direct effect on behavior (Y2). This is indicated by the significant value of p - value <0.05 level. Motivation variable (Y1) and a significant direct effect on behavior (Y2). This is also indicated by the significant value of p - value <0.05 level. During the knowledge variable (X2) and no significant direct effect on behavior (Y2). This is indicated by the significant value of p - value> 0.05 level. Next testing the indirect effect. Testing the effect of indirect use of some direct influence test results. Indirect effect coefficient obtained from the product of the two coefficients directly influences that shape it. Indirect effect was significant when both the direct influence of the shape coefficient was significant. The complete test results are not directly influence presented in Table 6.

From Table 6, it can see that there is an indirect influence between constancy variables (X3) toward behavior (Y2) of 0.102, knowledge variable (X2) toward behavior (Y2) of 0.054 and education variables (X1) toward behavior (Y2) of 0.101. It means that there is a positive indirect effect between constancy variables (X3), knowledge (X2) and education (X1) toward behavior (Y2).

Hypothesis Testing and Discussion

Based on the above exposure hypothesis can be ana-

Tabel 4. Regression Weights:

			Estimate	S.E.	C.R.	P	Label
motivation	<---	education	.278	.087	3.191	.001	par_1
motivation	<---	knowledge	.357	.160	2.241	0.25	par_3
motivation	<---	loyalty	354	.071	5.027	***	par_7
Behavior	<---	education	1.489	.113	13.150	***	par_2
Behavior	<---	motivation	.214	.085	5.521	0.12	par_4
Behavior	<---	knowledge	-.085	.195	-.434	.664	par_6
Behavior	<---	loyalty	-.314	.093	-3.374	***	par_8

Table 5. Standardized Regression Weights:

			Estimate
motivation	<---	Education	.206
motivation	<---	Knowledge	.145
motivation	<---	Loyalty	.325
behavior	<---	Education	.637
behavior	<---	Motivation	.123
behavior	<---	Attitudes	.233
behavior	<---	Knowledge	-.020
behavior	<---	Loyalty	-0.166

Table 6. Standardized Indirect Effects

	Constancy	Knowledge	Education	Motivation
Motivation	.000	.000	.000	.000
Behavior	.102	.054	.101	.000

lyzed as follows: the influence of the education workshops provider, knowledge about pollution and constancy with environmental regulations toward motivation on environmental sanitation furthermore to the waste management behavior in an insightful environment.

H01: There is no influence of the education workshop provider, knowledge about pollution and constancy with environmental regulations, toward motivation in environmental sanitation furthermore toward waste management behavior in an insightful environment.

Ha1: There is no influence of the education workshop provider, knowledge about pollution and constancy with environmental regulations, toward motivation in environmental sanitation furthermore toward waste management behavior in an insightful environment.

Based on the results of the analysis of a structural model of the SEM, the magnitude of the relationship manager education workshop, knowledge about pollution and constancy with environmental regulation toward motivation in the environmental sanitation of 0.278, 0.357, 0.354 with critical ratio value (CR) of 3.191, 2.241, 5.027 and probability (P) of 0.001, 0.025, 0.000. Because the value of CR >1.96 and value of P <0.05, so can explain that there was a significant direct influence on management education workshop, knowledge about pollution and constancy with environmental regulations against motivation on environmental sanitation. The magnitude of the direct influence of the coefficient of education workshop manager, knowledge about pollution and constancy with environmental regulations toward motivation on environment sanitation is marked positive, i.e. of 0.206, 0.145, and 0.325. It indicates the influence of management education workshop, knowledge about pollution and constancy with environmental regulations against motivation on environmental sanitation is positive. That is, the higher education provider workshops, knowledge about pollution and constancy with environmental regulations and increasingly higher motivation on environmental sanitation.

The magnitude of the relationship of motivation on environmental sanitation of the behavior in the management of waste environmentally is amounted of 0.214 with critical ratio (CR) of 2.521 and probability (p) of 0.012. Because the value of CR of >1.96 and value of P < 0.05, can explain that there was a significant direct influence on motivation sanitation environment toward waste management behavior in an insightful environment. The magnitude of the direct influence of the coefficient of motivation on environmental sanitation of the behavior in the management of waste is environmentally positive marked. It indicates the direct influence of motivation on environmental sanitation of behavior in waste management is positive of 0123. It means, the higher the motivation on the cleanliness of the environment than the higher waste management behavior in an insightful environment.

In addition to the motivational variables on the sanitation of the environment variable to be bridging the education variable workshop Manager, knowledge about pollution and constancy with environmental regulations against behavior indirectly in the management of waste environmentally, with a variable value of education workshop Manager of 0.637, knowledge about pollution -0.020, and constancy with environmental regulations -0.166, shown in the indirect effect.

Table 7. Indirect Effects - Group number 1

	Constancy	Knowledge	Education	Motivation
Motivation	.325	.145	.206	.000
Behavior	-.166	-.020	.637	.123

2) Relationship between variables with the indicators

a) Influence of each indicator against a garage Manager education is Formal education (X 1.1) with a

value of 0.42.70; Non Formal education indicators (X 1.2) and the value of the influence of 0.31.77; and indicators on education In Formal (X 1.3) with a value of 0.25.52 influence.

b) Influence of each indicator against knowledge of the pollution is the indicator of soil contamination (X2.1) with a value of 0.31.52; air pollution indicator (X2.2) with a value of 0.21.16; indicators of pollution from exhaust emissions (X2.3)with the influence value of 0.17.95; noiseindicators (X2.4) with the influence value of 0.15.70; and indicators of water pollution (X2.5) with the influence value of 0.13.66.

c) Influence of each indicators of constancy with environmental regulations is an indicator of constancy with sanitation(X3.1) with the value of 0.59.11; indicators of constancy with preservation of the environment (X3.2) with the influence value of0.17.98; indicators of constancy with environmental regulations and Legislation(X3.3) with the influence value of 0.13.81; and indicators of constancy with the provision of the means of waste (X3.4) with the influence value of 0.9.01.

d) Effects of each indicator against motivation on environmental sanitation is an indicator of the fineness and comfort of the environment workshop (Y1.1) with a value of 0.60.57; Workshop environmental health indicators (Y1.2) with theinfluence valueof 0.12.30; avoid work accident indicator (Y1.3) with the influence value of 0.10.64; improving performance indicators (Y1.4) with the influence value of 0.8.73; and for recognitionindicators (Y1.5) with the influence value of 0.7.75.

e) Influence of each indicator against behavior in waste management is environmentallysort indicators (Y2.1) with the influence value of 0.39.15; the shelter indicators (Y2.2) with the influence value of 0.20.91; the storage indicator (Y2.3) with the influence valueof 0.11.24; return utilization indicators (Y2.4) with theinfluence value of0.8.23; transport indicators (Y2.5) with the influence value of 0.7.86; discharge indicators (Y2.6)with theinfluence value of 0.7.64; recycled indicators (Y2.7) with the influence value of 0.4.97.

CONCLUSION

Based on the results of data analysis and statistical calculation as outlined in the discussion, then the findings obtained in this study are as follows:

1) Workshop Manager education has direct positive effect of motivation on environmental sanitation and has direct positive effect on the behaviour of waste management .
2) Knowledge about pollution has direct positive effect of motivation on environmental sanitation and has direct positive effect of behavior in waste management.
3) Constancy with environmental regulations has direct positive effect of motivation on environmental sanitation. It also showed direct positive effect against the positive behavior in waste management.
4) Workshop Manager education indirectly works through motivation on environmental sanitation of behavior in waste management environmentally meanwhile motivation on environmental sanitation has direct positive effect on the behaviour of waste management.
5) Knowledge of the pollution indirectly affects through motivation on environmental sanitation of behavior in waste management environmentally. Futhermore , environmental regulations has indirectly effect through motivation on environmental sanitation of behavior in waste management.
Based on the above findings, it can be concluded that the behavior of waste management is influenced directly and indirectly by workshops education, knowledge about pollution and constancy with environmental regulations, further motivation on environmental sanitation affect directly against waste management behavior in an insightful environment. Motivation on environmental sanitation variable influences variable that bridge the workshops education, knowledge about pollution and constancy with environmental regulations of conduct workshops behavior affects indirectly in the management of waste environmentally.

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