

THE EFFECT OF SITUATIONAL  
FACTORS AND  
PSYCHOLOGICAL FACTORS  
OF STUDENTS IN THE CHOICE  
OF THE MECHANICAL  
ENGINEERING EXPERTISE  
PROGRAM IN VOCATIONAL  
HIGH SCHOOLS IN THE

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YOGYAKARTA SPECIAL  
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# THE EFFECT OF SITUATIONAL FACTORS AND PSYCHOLOGICAL FACTORS OF STUDENTS IN THE CHOICE OF THE MECHANICAL ENGINEERING EXPERTISE PROGRAM IN VOCATIONAL HIGH SCHOOLS IN THE YOGYAKARTA SPECIAL TERRITORY

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## Abstract

This study aims to describe situational and psychological factors, the choice of the mechanical engineering expertise program, and find out determinations of situational and psychological factors on the choice of the mechanical engineering expertise program in Vocational High Schools (VHSs) in the Yogyakarta Special Territory. This was a correlational study which was ex post facto in nature. It was conducted in state and private VHSs belonging to the technology and engineering group in the mechanical engineering expertise program in the Yogyakarta Special Territory. The data were collected through inventories, observation sheets, and documents. The data were analyzed using the descriptive analysis, regression analysis, and path analysis. The results of the descriptive analysis show that the scores of situational factors are in the high category, those of psychological factors are in the high category, and that of the choice of the mechanical engineering expertise program in VHSs is in the high category. The research hypothesis testing shows that: (a) there are significant effects of situational factors (family, previous school, and social environments), and psychological factors (students' information mastery, self-understanding, and attitudes) on the choice of the mechanical engineering expertise in VHSs with a contribution of 53.8%; and (b) based on the results of path analysis showed that the choice of the mechanical engineering expertise program in VHSs by junior high school (JHS) graduates is dominantly affected by a situational factor in the form of social environment and the most influential psychological factors are students' self-understanding and attitudes.

**Keywords:** situational factors, psychological factors, determination of mechanical engineering expertise program in VHSs.

## 1. Introduction

After graduating from junior high school students have two alternative choice to continue formal education, namely Senior High School (SHS) and Vocational High School (VHSs) [1]. In the case of the elect to continue their education to VHS, the students of class IX Junior Secondary Schools need to get serious attention from the various parties in order to determine the choice of fields of expertise in VHSs them not mistaken. This is very reasonable considering there are 121 competencies skills offered at VHSs as specified in the spectrum of expertise vocational education [2].

Basically, the selection of areas of expertise is the process of fusion among the needs, expectations, and economic demands [3]. It also said that the selection of areas of expertise is the combination of interests, abilities, values,

opportunities, expectations and any limitations in the reality of life [4]. For that reason there needs to be an intensive information from the school and the parents to the Junior secondary School students related to the election of the expertise program in VHSs. The problems that happened in the election of the expertise program in VHSs by graduates of junior secondary school students, outline can be grouped into three, namely the problems associated with the guidance of parents and teachers, social influence society and the problems associated with the psychological aspects of the students.

Because of the extent of the spectrum of the expertise program in VHSs, so this research is focused on the selection of one of the expertise program in VHSs namely Mechanical Engineering Expertise Program. In this study the factors that influence the selection of fields of expertise are grouped into two categories,

namely external factors or environmental factors and internal factors or psychological factors of students. External factors (environment variable) is limited to the family environment, previous school environment, and the social environment, while to internal factors (psychological variable) limited to the mastery information, self-understanding, and attitudes of students in VHSs.

The choice of the field of expertise virtually is the process of fusion of between the needs, sources of private individuals, the demands of the economic, and socio-cultural conditions. "Ref. [3]" more information is also mentioned that the development of vocational someone is the interaction between the behavior, attitudes, ambitions and values of individuals with social factors surrounding it.

Decision making is a strange problem in the phase of development vocational someone [5]. The development of the individual personality is basically a mental processes a person as a consequence of its involvement in the community. To describe one's personality in the social life used the term self-identity (ego identity). Self-identity is formed due to the interaction between the three factors namely: biological conditions of the individual, psychological and social culture where individuals are located.

The choice of the field of expertise is a stable process that occurs on a certain period and is a combination of hope and the possibility of [6]. More information mentioned that there are three stages in the process of the choose of the field of expertise/vocational training a person namely: stage fantasy, tentative and realistic. The fantasy stage generally in children age around 6 -11 years. At this time the children start to show a focus on the work, but the children could not access the ability or opportunity and the limitations of reality. They acknowledge can be anything that they want. The orientation of their choice is still change. Tentative phase occurred on children age 11 - 17 years. At this time the children began to be aware of the problems faced by the associated with career or expertise of their future. They began to ponder potential they possess.

A person will be conducting a conscious choice between the various alternative choices that the aim is to maximize pleasure and minimize pain [7]. This theory is often called the theory of hope. According to this theory that a person who has established the purpose or the elect who have been taken can be motivated to make it happen if they believe that there is a positive correlation between the effort and the performance of the existence of the fulfillment of

the reward as desired, awards/prizes from the achievements of the obtained and a strong desire to meet the needs to make the time to work is very valuable. In the process of the choice of a career or expertise there are four variables which influence, namely: reality factors, educational process, emotional factors and personal values [8]. Reality factors regarding one response to the surrounding environment condition that forced to that person to make decisions related to his career. Educational process related to the quality and quantity of education obtained a person that allows open insights that person to determine career choice. Emotional factors are things related to the aspects of personality. Emotional factors are things related to the aspects of personality. Personal values are aspects of the value that is attached to a person who also influence in selecting a career. Personal values are aspects of the value that is attached to a person who also influence in selecting a career.

From a variety of theories and the formulation of the above it can be concluded that the factors that influence in the election of the field of expertise or someone career: emotional factors (interest, sense of hope/impact, and the establishment of the), personal factors (personality, character and values), educational factors (cognitive ability, psychomotor ability, experience of education and training), and reality factors (capacity/opportunities, fees and requirements of supporters). The election of the field of expertise is the individual psychological awareness of the objective world in its relation to the self [9]. "Ref. [3]", more information mentioned that the development of vocational someone being alone is the interaction between the behavior, attitudes, ambitions and values of individuals with social factors surrounding it. So the selection field of expertise is the process of the psychology of the individual to determine the right attitude and right in the face of something object. Characters or individual personality will affect the person in addressing a wide range of expertise or the work that is in the community [10]. This means that every person will choose a career or certain job in accordance with his character of each. Based on the theory of Holland was people will see into himself (understanding themselves) to measure suitable whether or not a career or work with himself. This means that the understanding of themselves (self knowledge) is one of the important factors that influence in the choice of the field of vocational training. "Ref. [8]" that a person will choose a vocational field or certain job if they have faith and hope that the work or chosen field of expertise will bring

success and he will be tried with all his strength to get the field of expertise or the work.

In determining the choice of a field of expertise is also influenced by factors outside of the individual or external factors. External Factors are factors outside of the individual is also often called as situational factors. The environment is basically all aspects or physical and social phenomenon that affect the organism someone [11]. Physical and social phenomenon is a source of information that can be obtained by someone through the vision, hearing and smell and taste. This information is then made one resourceful, knowledge and understanding about something objects.

All aspects of human life, regarding the art of science, religion, moral, culture, education, political, economic and family life will be very influenced by the situation of the condition of the environment [12]. Environmental differences can cause differences in the attitude of the individual, psychologically can be learned through three ways: (1) imitate the more achievement in certain fields, (2) combine the experience, and (3) Special experience with a profound emotional [13]. More information mentioned that human behavior follows the pattern or procedures for certain rules according to the way which has been patterned raw material in their environment [14].

From the explanation above can be drawn the conclusion that determination in choice of the mechanical engineering expertise program in VHSs is a mental process that is influenced by internal factors (Individual/psychological), or external factors (environment/ situational answer). The internal factors in this research are grouped into three main variables namely: students' information mastery, self-understanding, and students attitude toward VHSs). While external factors can be grouped into three main variables, namely: family environment, previous school environment and social environment.

The purpose of this research is: 1) to describe of situational factors, psychological factor and the choice of the mechanical engineering expertise program in VHSs, and 2) to find out determinations of situational and

psychological factors on the choice of the mechanical engineering expertise program in Vocational High Schools (VHSs) in the Yogyakarta Special Territory.

## **2. Method**

This was a correlational study which was ex post facto in nature. The population in this research are the students of class X the mechanical engineering expertise program in VHSs in the Yogyakarta Special Territory. The number of research population is 1095 students. The number of samples is determined by the research based on the determination of the size of the sample using equal to 5 percent error [15]. Based on the results of calculation obtained the size of the samples of 285 respondents (rounded). To anticipate the questionnaires and data that could not be also, the number of sample plus 5%. Thus the minimum samples used in this research is:  $285 (5\% \times 285) = 300$  respondents (rounded).

Sampling techniques used is proportional random sampling so that the number of sample is calculated based on the amount of the population groups each of the groups. Techniques for data collection in this research using questionnaires, observation sheet and documentation. The validity of the instrument in this research include the validity of contents and the validity of construct. To know the validity of the contents of the instrument was done through the expert with Delphi technique. The validity of construct is proved by using confirmation factor analysis to see whether the particulars of the instrument is suitable to assess the elements that are found in the change that has been specified [16]. The calculation of the reliability of the instrument using the rules of the Cronbach Alpha [17].

The data were analyzed using the descriptive analysis, regression analysis, and path analysis. Prior to the data analysis first tested which includes testing requirements analysis: normality, linearity, homoskedastisitas, and multicollinearity.

This research design is shown in figure 1 below.

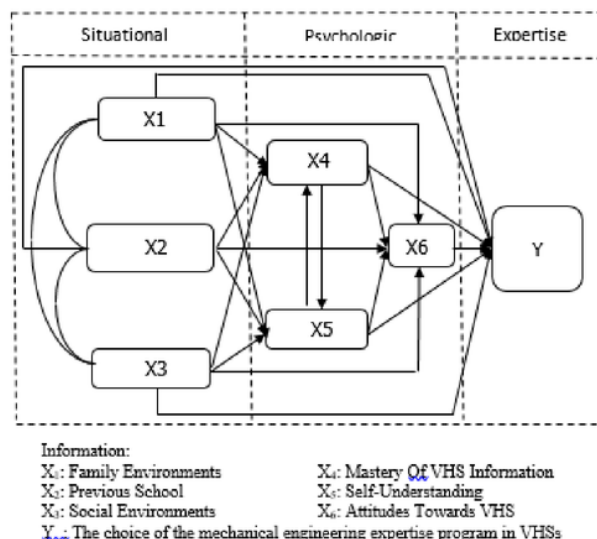


Figure 1. Research design

### 3. Results

The results of a descriptive analysis shows that the family environment, home school environment, social environment community, mastery of information, understanding themselves, attitudes the students and the selection of the field of expertise engineering at SMK by graduates of junior secondary school students including in the high category. Now the achievement of student response score from the highest score is assigned sequentially each is: 73,9%; 74,1%; 69.3%; 73.5%; 80,3%; 83,6%, and 81%. To fulfill the requirements of the analysis in this research done normality test, homoskedastisity test, linearity test, and multicollinearity test. The test results showed that normality score distribution and residual distribution of all the variables in this research qualify normality. This can be seen from the indicator as follows: a) score for each of the

distributed variable approach curve normal, b) seen from normal probability plots appear that the distribution of the data each of the variables are located around the diagonal lines and follow the direction of the diagonal lines, and c) tilt (skewness) each variable is located between -0,5 until 0.5.

Based on the linearity test, can be known that the value of F-count for each candidate, on the column linearity greater from F-table. This shows that the direction of regression lines all candidate means. Whereas if seen the value and the significance of F on the column deviation

from linearity, all meet the requirements of linearity (F-count <F-table or sig>0.05).

Based on the results on the scatterplot can be known that the distribution of the score of the points) all bound variables in the regression equation does not constitute a pattern and spread randomly around the zeros on the axles Y. Based on the review of the Park shows that the similarities regression specified in this research all qualify homoskedastisitas.

Based on the results of the test analysis multico linearity can be known that the correlation coefficient (r product moment) all independent variables in this research are under 0.85; the value of tolerance is greater than 0.1; and there is no value of VIF above 10. Thus it can be concluded that there is no evidence of a serious multicollinearity between independent variable.

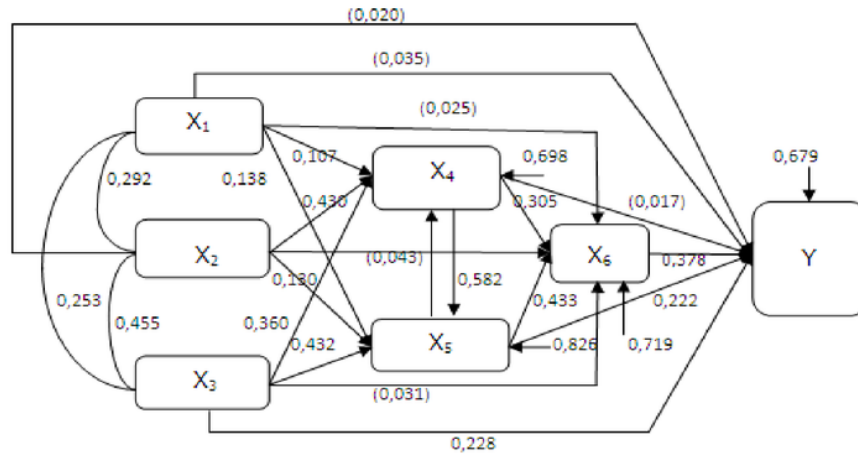
Based on the results of regression analysis showed that :

- a. There is a significant effect of family environment (X1), previous school environment (X2), and social environment (X3) to control students' information mastery (X4); (F=103,98; p<0.05). The determination coefficient (R<sup>2</sup>)=0,513; shows the contributions of three variables of 51.3%.
- b. There is a significant effect of family environment (X1), previous school environment (X2), and social environment (X3) on the self-understanding (X5); (F=45,216; p<0.05). The determination

- coefficient ( $R^2$ )= 0,314; shows the contributions of three variables of 31.4%.
- c. There is a significant effect of family environment (X1), previous school environment (X2), social environment (X3), the mastery of information (X4), and self-understanding (X5), on the attitude of the students at VHSs (X6); ( $F= 55,00$ ;  $p<0.05$ ). From the results of the analysis can also known the determination coefficient ( $R^2$ )= 0,483. This means that the contributions of five variables of 48.3%.
  - d. There is a significant effect of family environment (X1), previous school environment (X2), social environment (X3), mastery of information (X4), self-

- understanding (X5), and attitude of students (X6) on the choice of the mechanical engineering expertise program in VHSs (Y); ( $F=56,815$ ;  $p<0.05$ ). The determination coefficient ( $R^2$ )= 0,538; shows donations six variables of 53.8%.
  - e. Based on the values of the predictors and constant obtained from multiple regression analysis, the multiple regression equation can be formulated as follows:  

$$Y=12.199+0.153X_1+0.022X_2+0.239X_3+0.219X_4+0.284X_5+0.366X_6$$
- Empiric causal relationship model which contains the regression weight ( $\beta$ ) or full model line coefficient presented in Figure 2.



Information:  
 X1: Family Environments      X4: Mastery Of VHS Information  
 X2: Previous School          X5: Self-Understanding  
 X3: Social Environments      X6: Attitudes Towards VHS  
 Y : The choice of the mechanical engineering expertise program in VHSs

Figure 2. Model of causal relationships

The results of path coefficient significance test can be seen in Table 1.

Table 1. A summary of the results of the path analysis

Variable	Dependent	Independent	Direct effect	Indirect effect through			Total ETL	Total effect	Non-causal effect	Correlation
				X <sub>4</sub>	X <sub>5</sub>	X <sub>6</sub>				
X4		X <sub>1</sub>	0,187	-	-	-	-	0,187	0,137	0,324
		X <sub>2</sub>	0,430	-	-	-	-	0,430	0,195	0,625
		X <sub>3</sub>	0,360	-	-	-	-	0,360	0,223	0,583
X5		X <sub>1</sub>	0,138	-	-	-	-	0,138	0,147	0,285
		X <sub>2</sub>	0,130	-	-	-	-	0,130	0,237	0,367
		X <sub>3</sub>	0,432	-	-	-	-	0,432	0,094	0,526
X6		X <sub>1</sub>	-	0,063	0,061	-	0,124	0,124	0,107	0,231
		X <sub>2</sub>	-	0,146	0,057	-	0,203	0,203	0,198	0,401
		X <sub>3</sub>	-	0,122	0,190	-	0,312	0,312	0,136	0,448
		X <sub>4</sub>	0,340	-	-	-	-	0,340	0,255	0,595
		X <sub>5</sub>	0,439	-	-	-	-	0,439	0,197	0,636
Y		X <sub>1</sub>	-	0,025	0,057	-	0,093	0,175	0,099	0,274
		X <sub>2</sub>	-	0,057	0,053	-	0,103	0,213	0,159	0,372
		X <sub>3</sub>	0,245	0,048	0,177	-	0,287	0,532	0,013	0,545
		X <sub>4</sub>	-	-	-	0,133	0,133	0,133	0,400	0,533
		X <sub>5</sub>	0,238	-	-	0,171	0,171	0,409	0,206	0,615
		X <sub>6</sub>	0,390	-	-	-	-	0,390	0,261	0,651

Based on the calculation of the influence directly and indirectly will be known:

- a. The direct effect of the family environment against the choice of the mechanical engineering expertise program in VHSs is not significant. The indirect effect through the mastery of information and the attitude is not significant. But the indirect effect through the self-understanding and the attitude of the students is significant.
- b. The direct effect of the school environment against the choice of the mechanical engineering expertise program in VHSs is not significant. But the indirect effect through self-understanding and the attitude of the students significantly, and indirect effect through the mastery of information and the attitude of the students is significant.
- c. The direct effect of social environment against the choice of the mechanical engineering expertise program in VHSs is significant, and indirect effect through self-understanding and the attitude of the students is significant. This means that the social environment has a very important role in the choice of the mechanical engineering expertise program in VHSs.

#### 4. Discussion

Based on the results of hypothesis testing in this study can be seen that there is a significant effects of situational factors (family, previous school, and social environments), and psychological factors (students' information mastery, self-understanding, and attitudes) on the

choice of the mechanical engineering expertise program in VHSs. This suggests that the family environment, school environment, social environment, information mastery, self-understanding and attitudes of students at VHSs has significant effects on the choice of the mechanical engineering expertise program in VHSs. While individually family environment, social environment, information mastery, self-understanding and attitudes of students at VHSs has significant effects on the choice of the mechanical engineering expertise program in VHSs. But the school environment had no significant effect. It shows that the high and low level of accuracy in the choice of the mechanical engineering expertise program in VHSs will be affected by the high and low quality family environment, social environment, information mastery, self-understanding, and attitudes of students in VHSs.

With the effect of family environment on the choice of the expertise program in VHSs, then the research findings is consistent with the results of other studies that have found that with the guidance and direction of their parents, the children have a positive insight on the selection of fields of expertise submit their work [18]. The results of this study are also in line with the study that concluded that the quality of the relationship or interaction with parents and family functioning is not optimal degree of influence about 14 % of the variation of the determination of a child's career [19].

The results of path analysis showed that the direct effect of family environment on the choice of the mechanical engineering expertise program

in VHSs is not significant, and the indirect effect through the mastery of information and attitudes are not significant, but the indirect effect through self-understanding and attitudes significantly. The results of path analysis showed that the mastery of information and attitudes students have less significance in explaining the effect of family environment on the choice of the mechanical engineering expertise program in VHSs. These results are in line with research that states that the control information of the graduates of junior high school students is still lacking, so will result in the perception and attitude at VHSs poor, which in turn will greatly affect the accuracy in determining areas of expertise program in VHSs [20]. The results of the analysis also showed that the family environment can not be directly influencing the choice of the mechanical engineering expertise program in VHSs without guided by self-understanding and students' attitudes towards VHSs. These findings are in line with the idea that the family environment, especially parents have a very dominant role in the formation of children's personality or attitude and self-concept (self-understanding) [21].

The results of path analysis showed that the direct effect of the school environment for the choice of the mechanical engineering expertise program in VHSs is not significant. But the indirect effect through self-understanding and attitudes significantly, and the indirect effect through the mastery of information and attitudes significantly. This suggests that self-understanding, mastery of information and attitudes have meaning in explaining the origin of the school environment influences the choice of the mechanical engineering expertise program in VHSs. The better the quality of the previous school environment will lead to better self-understanding, mastery of information and attitudes of students at VHSs that ultimately determine the better or more precise in the choice of the mechanical engineering expertise program in VHSs. The results are in line with the suggestion that schools with teachers who qualified were able to bring the students who have the capability to vary achieve good academic achievement, mastery of information, and fostering attitudes and expectations are high in the election areas of expertise or future job [22].

The direct effect of the social environment on the choice of significant areas of expertise program in VHSs and indirect effect through self-understanding and attitudes significantly. This means that the social environment has a very important role in the choice of the mechanical

engineering expertise program in VHSs. Besides, the results of the path analysis also showed that the self-understanding and attitudes have meaning in explaining the effect of the social environment on the choice of areas of expertise program in VHSs. The better the quality of the social environment will lead to better understanding of ourselves and the attitudes of the students at the VHSs that ultimately determine the better or more precise in the choice of the expertise program in VHSs. The findings are in line with the idea that the social environment is very influential on the formation of attitudes and behavioral patterns, perspective and understanding of what is happening in the environment, especially with regard to career or job [23].

## 5. The conclusion

Based on the results of the descriptive analysis shows that the situational factors (family environment, school environment, and social environment), and psychological factors of students (mastery of information, understanding themselves, attitudes students) and the choice of the mechanical engineering expertise program in VHSs by graduates of junior secondary school, including in the high category. This shows that both situational factors or psychological factors of graduates from junior secondary school showed a positive image in the choice of the mechanical engineering expertise program in VHSs. Now the achievement of student response score from the highest score is assigned sequentially each is: 73,9%; 74,1%; 69,3%; 73,5%; 80,3%; 83,6%, and 81%.

Based on the results of multiple regression analysis shows that there is a significant influence family environment, home school environment, social environment, mastery of information, the understanding of themselves and the students attitude toward the choice of the mechanical engineering expertise program in VHSs with a donation of 53.8%. Based on the determination of coefficient partial, attitudes students have the greatest contribution to the choice of the mechanical engineering expertise program in VHSs (13.8%), followed sequentially social environment (6.3%), the understanding themselves (5%), the mastery of information (4.6%), family environment (3.2%), and the school environment (0.7%). Thus the attitude of the students have the effect of more dominant in determining the choice of the mechanical engineering expertise program in VHSs.



Now the results of the path analysis as follows:

- a. The direct effect of family environment against the choice of the mechanical engineering expertise program in VHSs is not significant. But the indirect effect through the self-understanding and the attitude of the students is significant.
- b. The direct effect of previous school environment against the choice of the mechanical engineering expertise program in VHSs is not significant. But the indirect effect through self-understanding and the attitude of the students is significant. So also the indirect effect through the mastery of information and the attitude of the students is significant.
- c. The direct effect of social environment against the choice of the mechanical engineering expertise program in VHSs is significant. So also the indirect effect through the self-understanding and the attitude of the students is significant.
- d. Psychological factors in the form of the self-understanding and the attitude of the students have significant effect either directly or indirectly in determining the choice of the mechanical engineering expertise program in VHSs, while the mastery of information does not provide the direct effect on the choice of the mechanical engineering expertise program in VHSs but a role in improving the attitude of the students to then influence in the choice of the mechanical engineering expertise program in VHSs for graduate of Junior Secondary Schools.

The results of the path analysis shows the important role of the variables understanding themselves and the attitude of the students of VHSs in explaining the influence of various situational factors (the environment his parents and the school environment, social environment) against the choice of the mechanical engineering expertise program in VHSs. In addition to the mastery of the information also shows a significant role in the improvement of the accuracy in the choice of the mechanical engineering expertise program in VHSs through the attitudes towards VHSs. Therefore very reasonable for more give priority in the development of the three psychological factors in the effort to enhance the role of the aspects of situational factors (family environment, previous school environment, and social environment) in improve the accuracy in the choice of the mechanical engineering expertise program in VHSs.

## 6. Suggestions

Under the results of this research, recommended:

- a. Empowerment needs to be done on the parents of the students especially related to insights about advanced school especially related to the program that is in conventional and about the working world.
- b. Junior Secondary Schools need to improve vocational guidance program, planting the entrepreneurial spirit, bring industry practitioner to schools for speeches, visit the students to the world of business/industry and the introduction of various types of work and the field of expertise in society that inserted in lessons related. It is intended that the students have a broad knowledge about the working world and can capitalize on students the attitude of discipline, resilient, honest, independent and eager to work hard.
- c. The government in this case the Ministry of National Education needs to be more effective imaging VHSs in the community through both printed or electronic media.
- d. The junior secondary school students need to be encouraged to be able to increase the capacity of themselves especially related with the ability to control the mastery of VHSs information, the self-understanding, and the development of the attitude towards VHSs by providing various media access information and counseling vocational training which more intensive.

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GRADEMARK REPORT

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FINAL GRADE

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GENERAL COMMENTS

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