THE INFLUENCE OF MOTIVATION, LEARNING STYLES, TEACHER LEADERSHIP, AND TEACHING INTENSITY ON STUDENTS' LEANING OUTCOMES

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ABSTRACT

This study aims to determine the correlation and the contribution of motivation, learning styles, teacher leadership, and the intensity of teaching on the learning outcomes of X grade students in Mathematics at Vocational High Schools. This study is an ex-post facto with a total sample of 234 students. The data is collected by questionnaire and analyzed by descriptive statistics as well as correlation and multiple regression with significance level of 5%. The analysis shows that the students' motivation and learning styles still need to be improved, while the teacher leadership and teaching intensity need to be maintained. The result of correlation analysis shows that motivation, learning styles, teachers' leadership, teaching intensity, and learning outcomes correlate from 0.532 to 0.627. The result of dual regression analysis shows that the contribution of motivation learning styles, teachers' leadership and teaching intensity on the students' learning outcomes were 0.381, 0,199, 0.223 and 0.175 respectively.

Keyword: motivation, learning style, teachers' leadership, teaching intensity

INTRODUCTION

Learning in Vocational High Schools (SMK) is more geared to vocational technology education, which is adapted to the development of technology in the business industry. Vocational technology education according to Kuswana (2013: 182) is the secondary school which provides specific skills to students aiming at improving the skills of students to specific fields. SMK as vocational education consisting of some expertise programs that serve to educate students based on the selected expertise program. In addition, vocational education graduates are also expected to be independent and ready to compete in the work force. The success of education is inseparable from the curriculum in Vocational High Schools (SMK).

Mathematics is a compulsory subject available in each curriculum of secondary education in Indonesia. Mathematics learning materials implemented in schools are adjusted to education level and type of education. The materials are interrelated and continuous from the previous materials. Students who have difficulties in completing a mathematics problem will possess difficulties in the next learning materials. Learning Mathematics in Vocational High Schools is different from Senior High Schools. It is further focused on the students reasoning ability which requires students to keep thinking in order to solve the problems. Students who have a low awareness in learning Mathematics will get lazy in doing the tasks because they are unable to think using their logic to find solutions to the problems. The learning outcomes achieved by students is not satisfied.

Learning outcomes can be influenced by several factors, including the students their selves and also the environment (Junianto, 2015). Learning outcomes influenced by factors arising from the students are motivation and learning styles. While the environmental factors are academic environment of the school, teachers' leadership during the learning process, and teaching intensity.

Mathematics is a deductive science, which is definite or coherent. In addition,

Mathematics is logical and structured. The general principle of Mathematics is general characteristics in general views understood by students, parents, teachers, experts, and society. According to Sumardyono (2004: 30) the natures of Mathematics are: (1) it owns abstract object of study, namely facts, concepts, operations, relations, and principles; (2) it rests on opportunities, namely agreement or rules that exist in the use of symbols and terms; (3) it is deductive thinking, namely discovery of formula or new theorem in mathematics, which was then adjusted to an existing and undefined theorem; (4) it is consistent with the system, namely algebra, its calculation consists of linear, Boolean, and matrix algebra; (5) it has symbols with empty meanings; (6) it regards on the universe namely the scope of mathematic workmanship.

According to the Regulation of National Education Ministry Number 22 of 2006 about the content standard of Mathematics courses, it is mentioned that Mathematics in Vocational High Schools has several objectives (Sadiq, 2008: 1), namely (1) understanding concepts, explaining linkages between concepts, and applying the concepts flexibly, accurately, efficiently and appropriately in solving problems; (2) using reasoning on patterns and natures, making manipulation in making generalizations, compiling evidence, and explaining mathematical statements; (3) completing issues that include the ability to understand the problem, to design, and to finish the model, as well as to interpret the results; (4) describing ideas with symbols, tables, diagrams, or other media to clarify situations or problems; (5) possessing characteristics of curiosity, attention, and interest in studying Mathematics, as well as confidence and perseverance in solving mathematical problems. Based on these explanations, it is known that mathematics has a broad scope. Mathematics requires student activities in learning and solving the problems. The success of Mathematics in SMK greatly affects the success of learning, for example mathematical operations in Computer and Network Engineering.

Computer and Network Engineering. includes programming. It requires a high-logic thinking in the process as in designing an algorithm program used as the initial design of the program. Making the algorithm is inseparable from an understanding of mathematical logic. This understanding can scaffold students to find the best algorithm formula in quick and structured manner.

Learning is defined as self-potential changes manifested from experiences and knowledge which are perceived and then engaged in a state associated with the experiences. Maher (2004: 47) suggested that learning outcomes is the result of a study focused on the achievement obtained by the students and this is the correct and more realistic measurement about the values of education, so that students have the crucial position in the measurement and teachers play an important role to achieve the educational success. Learning outcomes are measured based on the student achievement in a single subject.

The success of learning is characterized by the learning results achieved by the students. Mappeasse (2009: 4) stated that student learning outcomes can be influenced by several factors, namely the efforts exerted by students in achieving the learning outcomes, intelligence, and preliminary mastery of materials to be taught, and opportunity given to the students to explore the learning materials.

Sukmadinata (2011: 162) added that the factors could be resulted from the inner self and from the outside or the environment. The internal factors from the students are: (1) physical aspects including health and physical condition of the students. The physical condition covers the health of the body and the five senses. Physical health of students is indispensable in the learning process. Students who are healthy physically are more ready to accept the lesson. This physical aspect is also called as physiology aspect; (2) spiritual aspects take account of the students' psychological

condition, the ability to think, and the cognitive, affective and psychomotor conditions. Spiritual aspect is also known as psychological aspect. Spiritual aspects affect the psyche and feelings of individuals. Students who have a good physical aspect does not necessarily have a good spiritual aspects as well. Spiritual aspects make students able to compete fairly. Spiritual aspect according Shah (2001:132) consists of intelligence, motivation, interest, talent, and behavior.

The environmental factors that affect students' learning outcomes, according Sukmadinata (2011: 164), consist of three factors namely: (1) Family environment is the basic environment in the learning process. It is the early fundamental environment for students to learn. The physical state of good family for example housing conditions, home environment, and family can be determinants for the student success in learning; (2) School environment is essential for the success of learning. They include the school physical environment such as facilities, learning media, and learning resources; the social environment for instance relationships between friends, teachers, and other school communities that teach students to be able to get along well; and the academic environment such as the implementation of learning, vocational guidance, industrial information, extracurricular activities; and (3) Society environment is the environment where students apply the knowledge acquired in the family and in the school. Society teaches students on the use of ethics and values existed in the society. It is expected that the environment has a huge impact on the psychological development of students. In addition, the community is expected to provide new knowledge about how to adapt well.

Motivation is an impulse from the individual. Motivation can be created through self-awareness or originated within ourselves (intrinsic motivation) and the encouragement of others or the environment (extrinsic motivation). Alessi and Trollip (2001: 24) stated that motivation is essential to learning. Motivation is an essential component required in the learning process. It encourages students to implement the learning process effectively. Students who have high motivation are able to achieve higher performance than those who have low motivation. The greater motivation achieved the greater learning goals. Mathematics is exact science that requires diligence and thoroughness in the process of learning. The level of difficulty in learning Mathematics is a challenge to motivation.

Learning styles are ways that are used in learning process. Law and Glover (2000: 167-168) identify that the success of a learning is very dependable on the learning and teaching strategies used to maximize the students ability. In addition, teachers also need to consider the appropriate learning strategies to fit the student's learning styles. Learning styles possess many benefits or advantages in learning. The teachers should understand the condition of the students and the students themselves also should understand the abilities and learning styles they have.

Bush (2011: 170) explains that teachers need enrich their teaching techniques by considering the situation and conditions occurred in the classroom by doing a transmission approach to determine the appropriate way of teaching that can be applied to get a better understanding about the students' learning process and learning styles. The teacher active involvement can improve their capacities to determine how to teach appropriately in accordance with students' learning styles. Subsequently, well-directed learning styles can improve the students' knowledge and their enjoyment while learning.

Gilakjani (2012) noted that a good understanding of learning styles is the most important thing in learning because it can assists students in finding the best way to learn effectively and also teachers to teach efficiently and accommodate the students' learning styles. These can increase the overall student learning outcomes. The balance occurred between the

teacher and students in class may have a positive impact on the development of students in learning.

A teacher needs to recognize the students' learning styles in Mathematics, in order to guide them to an effective learning. Mathematics requires a high-level understanding. It is easier for the teacher to interact, the learning becomes more attracting, and the learning objectives can be achieved. In addition, the teacher understands the condition of the students better and appreciates them during the learning process, and also the students become more comfortable.

Self-leadership is shaped from one's way to recognize, regulate the behavior and thoughts in accordance with the objectives to be achieved. Greenfield and Ribbins (1993) in the Bush (2011: 6) stated that leadership begins with the character possessed by a leader and it is manifested in the form of self-assessment, self-awareness, and the ability to control emotion and moral. In education, leadership is required by schools, teachers, and students. Teacher leadership is an important process that greatly influences the success of the school.

York-Barr and Duke (2004) in IEL (2008: 4) states that teacher leadership is the process by which teacher, individually or collectively, influence their colleagues, principals, and other members of the school communities to improve teaching and learning practices with the aim to increase students' learning and achievement. It is a process of teachers influences principals, colleagues, and members of other schools, such as students, to improve the teaching and learning process so that the learning objectives can be achieved. Teacher leadership is the nature of teachers who have influences on the inside and outside the classroom to improve education.

Teacher leadership in the learning environment must be adapted to the type of the teaching subjects. Each subject has different characteristics, for instance Mathematics. Mathematics is a subject that requires a teacher as the sole leader. Teachers should be able to influence students to be able to accomplish a given task and learn actively and independently, and to provide a sense of comfort to the learning process in class. The structured and systematic teaching process will give good results on the students' understanding. Materials provided to students make them more focused. Teachers considerate more about the learning process in class and put their positions well. Then, a good interaction can be created between both teachers and students in every meeting.

Teaching intensity is a quantity of or frequency or number of meetings, materials and activities that have been adapted to the curriculum. Materials and activities in each meeting have been included in the syllabus. The intensity of teaching is one of the benefits of teaching purposes namely selecting teaching strategies. Teaching strategies used during the learning process must be adapted to the purpose of teaching, students' prior knowledge, subjects, time and facilities, number of students, and teachers' teaching experiences (Hamdani, 2011: 156).

The intensity of the teaching of Mathematics becomes a main concern that must be met because Mathematics is a subject with a lot of materials and a high level of difficulty. The materials should be neat and in a sequence to be easily understood. In terms of meetings, teachers are expected to fits the number of meetings fully so that the students can achieve the optimal learning outcomes.

METHODS

This study is carried out by implementing ex-post facto approach. The research population is 10th grade students who take Mathematics at SMK Negeri Pontianak consisting of 576 students. The research sample consists of 234 students selected using proportional random sampling technique. The obtained data concerns some matters of motivation, learning styles, teachers' leadership, teaching intensity, and learning outcomes. To obtain data, this study used observation, questionnaire, and documentation. Observation is used to see the learning process and the physical classroom condition. The observations are conducted using observation lists. A questionnaire is administrated to obtain data from each independent variable. In addition, documentation is used to collect data in the form of documents related to learning outcomes. The data is analyzed by descriptive statistics and inferential statistics which cover correlation and multiple regression. The result of data analysis for the requirement test is presented in Table 1.

Table 1. The Data Analysis of the Requirement Test

Variable	Data Normality	Data Linearity	Data Multicollinearity
Motivation	0.471	0.155	1.454
Learning Style	0.147	0.990	1.464
Teacher Leadership	0.343	0.462	1.940
Teaching Intensity	0.456	0.533	1.946

Table 1 reveals the variables, namely motivation, learning style, teacher leadership, and teaching intensity are normal and linear aspects are not correlated, thus they are applicable in inferential analysis.

RESULTS AND DISCUSSION

The questionnaires on motivation reveals that respondents who answer strongly agree, agree, disagree, and strongly disagree were were 16,89%, 46,85%, 31,60% and 4,67% respectively. The statistical analysis results shows the scores of mean, median, mode, standard deviation, variance and skewness were 102.10, 102.00, 98, 10.487, 109.969, and 0.207 respectively. The positive value on motivation's skewness or right-oblique explains the students' low motivation that needs to be improved. The questionnaires on learning styles are responded with 16,49% strongly agree, 47,21% agree, 29,50% disagree, and 6,88% strongly disagree. The scores of mean, median, mode, standard deviation, variance and skewness were 73.80, 73.00, 73, 6.122, 37.481, and 0.295 respectively. The skewness value which is positive or right-oblique explains that students' learning styles is low and needs improvement. The questionnaires on teacher leadership are responded by the students with 25,79% strongly agree, 48,57% agree, 19,89% disagree, and 5,75% strongly disagree. The statistical analysis on this variable shows the scores of mean, median, mode, standard deviation variance, and skewness were 82,41, 83,00, 77, 13,208, 174,458, and -0,601 respectively. The skewness value is marked as negative or left-oblique conveying the students' perspectives on the teacher leadership considered to be good and should be maintained.

Table 2. Between-variable Coefficients

		Motivation	Learning Styles	Teacher Leadership	Teaching Intensity	Leaning Outcomes
Motivation	Pearson Correlation	1	.422**	.346**	.490**	.627**
	Sig. (1-tailed)		.000	.000	.000	.000
	N	234	234	234	234	234
Learning Styles	Pearson Correlation	.422**	1	.493**	.360**	.532**
	Sig. (1-tailed)	.000		.000	.000	.000
	N	234	234	234	234	234
Teacher Leadership	Pearson Correlation	.346**	.493**	1	.634**	.563**
	Sig. (1-tailed)	.000	.000		.000	.000
	N	234	234	234	234	234
Teaching Intensity	Pearson Correlation	.490**	.360**	.634**	1	.574**
	Sig. (1-tailed)	.000	.000	.000		.000
	N	234	234	234	234	234
Learning Outcomes	Pearson Correlation	.627**	.532**	.563**	.574**	1
	Sig. (1-tailed)	.000	.000	.000	.000	
	N	234	234	234	234	234

**. Correlation is significant at the 0.01 level (1-tailed).

The calculation of correlation data simultaneously independent variables such as motivation, learning styles, teacher leadership, teaching intensity and learning outcomes are used to see the magnitude of the correlation to all independent variables together on learning outcomes, as shown in Table 3.

Table 3. Collective Correlation of Independent Variables for Learning Outcomes

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.755[a]	.571	.563	7.15890

a. Predictors: (Constant), Teaching Intensity, Learning Styles, Motivation, Teacher Leadership

Based on Table 3, the magnitude of the correlation value of independent variables on the dependent variable is accountable by looking at the value of R in the table. Furthermore, to determine the magnitude of the coefficient of determination we can refer to R-square. The magnitude of the correlation coefficient (R) and the determination coefficient (R-square) together with independent variables are 0.755 and 0.571. It means 57.1% of learning outcomes is determined by motivation, learning styles, teacher leadership, and teaching intensity. While 42.9% of learning outcomes is determined by other factors.

Multiple regression is a regression calculation of a set of independent variables, motivation ($X_{1)}$, learning styles ($X_{2)}$, teacher leadership ($X_{3)}$, and the intensity of teaching (X_4), towards learning outcomes (Y). Multiple regression model has influence, it can be seen from the significance value contained in the Anova table. The value of variable sig. <0.05, multiple regression models can be used to predict the outcomes of learning (Y). The following table displays multiple regression Anova for learning outcomes (Y):

Table 4. Multiple Regression Anova

Anova[b]					
Model	Sum of Squares	DOF	Mean Square	F	Sig.
Regression	15596.6	4	3899.1	76.081	.000[a]
Residual	11736.2	229	51.250		
Total	27332.8	233			

a. Predictors: (Constant), Teaching Intensity, Learning Styles, Motivation, Teacher Leadership

b. Dependent Variable: Learning Outcomes

In Table 4, it is obtained a significance value for the learning outcomes (Y) at 0.000. It means that the motivation variable ($X_{1)}$, learning styles ($X_{2)}$, teacher leadership ($X_{3)}$, and the intensity of teaching (X_4) can be utilized to predict the learning outcomes (Y). The next step is analyze the multiple regression equation to see the coefficient table in Table 5. Based on Table 5 multiple regression equation, namely the constant value (a) amounted to -28.417 and regression coefficient ($b_{1)}$ of 0.393, the regression coefficient ($b_{2)}$ of 0.352, the regression coefficient ($b_{3)}$ of 0.183, and the regression coefficients ($b_{4)}$ amounted to 0.225.

The regression equation obtained:

$$\hat{Y} = -28.417 + 0.393\,X_1 + 0.352X_2 + 0.183X_3 + 0.225X_4 \quad (1)$$

From Table 5 it can be identified the magnitude of the contributions made by each independent variable (X) on the dependent variable (Y), namely the contribution of motivation (X_1) at 0.381, learning styles (X_2) at 0.199, teacher leadership (X_3) at 0.223, and teaching intensity (X_4) at 0.175. The biggest variable contribution comes from the motivation that is 0.381.

Table 5. Multiple Regression Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	-28.417	6.251		-4.546	.000
	Motivation	.393	.054	.381	7.289	.000
	Learning Style	.352	.093	.199	3.793	.000
	Teacher Leadership	.183	.049	.223	3.697	.000
	Teaching Intensity	.225	.078	.175	2.896	.004

a. Dependent Variable: Learning Outcomes

Based on the regression coefficient table, the value of statistical significance (Sig.) on motivation, learning styles, and teacher leadership variable is 0,000 while the value of the Sig. on teaching intensity variable is 0.005. It can be stated that all independent variables have impacts on student learning outcomes as the Sig. value shows ≤ 0,05 and the regression model can be used to determine the value of learning outcomes.

CONCLUSION

The conclusion is motivation, learning styles, teacher leadership, and the intensity of teaching have significant contributions or influences on the learning outcomes with the highest variable contribution is motivation at 0.381. The second highest variable contribution is teacher leadership at 0.223. The third place is learning style at 0.199. The fourth place is intensity of teaching which contributes 0.175. The students' motivation of Mathematics in the field is still low referring to the lack of efforts in completing the tasks given. It was indicated from the positive skewness at 0.207. While, the motivation has the greatest contribution for students' learning outcomes at 0.381. Therefore, the motivation still needs to be improved. Teacher as a leader in the classroom can be a facilitator for students to improve their motivation. In addition, students can increase motivation through high self-awareness to succeed. The learning styles of the students of SMK N 4 Pontianak are still low and needs to be improved. Teacher should further optimize the way of teaching so that students become more interested in learning and improve their learning abilities. Teacher should also implement strategies and more innovative teaching methods to train the student's learning

styles so that they can obtain more satisfying learning outcomes. The teacher leadership and teaching intensity is categorized as good. Teacher is expected to increase the willingness of students to learn such as giving tasks and applying problem solving during learning process. The learning results obtained by students are still low, viewed from skewness which shows positive at 0.329. Teacher and principals should pay more attention to the conditions and difficulties possessed by students so that they feel more comfortable and active while learning.

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